Individual and Group Differences in the Interpretation of Terminology: Politicians' Use of the Term *Sustainability* in the Environmental Debate

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Voorwoord:

Deze scriptie is voortgekomen uit de combinatie van twee persoonlijke interesses. Allereerst, een fascinatie voor de inter- en multidisciplinaire studie naar taalfilosofische vraagstukken, vraagstukken waarvan in de begripsvorming mijns inziens slechts progressie geboekt kan worden door het hebben en houden van een open en wijde blik, waarin vakdisciplines samenwerken en elkaar aanvullen. Daarnaast was voor de inhoudelijke invulling van deze scriptie mijn interesse in ecologische - en milieuvraagstukken doorslaggevend, daar ik in de volle overtuiging ben dat dit enkele van de centrale vraagstukken zijn die mijn generatie in de nabije toekomst bezig zullen gaan houden.

Graag zou ik van deze gelegenheid ook gebruik maken door in de vorm van een korte dankbetuiging mijn erkentelijkheid te tonen aan enkele personen die van grote betekenis voor mij zijn geweest tijdens het schrijven van deze scriptie.

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Ook mijn tweede lezer, Prof. Dr. Arie Verhagen, verdient mijn dank. Al te meer omdat hij niet alleen als tweede lezer fungeert, maar mij ook vooral in de eerdere fasen van het specificeren van mijn onderzoeksfocus en het eigenlijke schrijfproces de nodige begeleiding heeft geboden. Hiernaast heeft hij mij ook zeer geholpen in het vinden van een begeleider en eerste lezer.

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Mochten er vragen of opmerkingen zijn naar aanleiding van deze scriptie, dan zie ik deze met graagte tegemoet,

Zoetermeer, Juli 2014

Ruben Pieter van Popering

Abstract: This paper is aimed at offering a theoretical discussion and interdisciplinary investigation into theories and concepts concerning categorization and individual and/or group differences in cognition. From this it is suggested that there is the possibility of miscommunication, or at least degradation of the communicative value of a message, as the result of perception and/or reception differences concerning the connotations (consisting of all combined properties and implications) of specific lexical items between individuals and/or groups. These differences are suggested to be present both in practical instances of use as well as in people's prototypes of said terms. Based on these theoretical expectations a schematic model is created, and a possible solution in the form of intralingual intersemantic translation is suggested. The theory, model, and solution are exemplified through an investigative qualitative case study into the use of the term *sustainability* by several political leaders in environmental speeches.

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I. Introduction

In the environmental debate many abstract terms with a rich and diverse meaning are used. Terms such as *well-being*, *stability*, and *balance* are at the center of climate change discussions. However, debates on these issues are oftentimes held by discussants representing a multiplicity of parties involved; people that might hold mutually incompatible worldviews and life philosophies, such as anthropocentrism and biocentrism. From this point of view, it can be stated that the different participants involved in climate debates are parts of very different subcultures. As a result of this the environmental debate could be seen as a form of intercultural communication. Consequently it can be expected that the relevant terminology is used by interlocutors with completely different socio-cultural backgrounds, which might greatly affect their semantic judgment of lexical items that are at the core of environmental discussions.

A great example of how key terms in the environmental debate can be used in practice to signify radically different intentions, and with that meanings, can be found in a BBC daily politics interview (27 Sept. 2013) with Matt Ridley, a multifaceted journalist, entrepreneur and political conservative, and Polly Toynbee, a social democratic journalist, among other guests. In the interview, discussing the effects and implications of a recent global warming report, Ridley's wording offers a great example of how single lexical items can signify completely different intended and/or received messages based on what context one uses as a basis, as he states that "the consensus view in science is that up to about 2 degrees you don't see net harm to either the economy or the ecology of the planet" (1.15-1.33). This one sentence strikingly shows how *net harm* can be used to express harm to the economy, as well as harm to the ecology; two effects which are lexically (fairly) similar, but have hugely different effects on the message that is actually intended and/or conveyed with the term *net harm*. Although these forms of usage clearly don't differ so extremely that the usage of *net harm* can be seen as homonymous, the term definitely shows signs of a case of polysemy in which even though possible word meanings are connected, the implications and properties connected to the various uses of *net harm* differ strongly. Apparently Ridley himself is also very aware of this important difference, as he chooses his wording so that it has an intrinsic message of thorough specification of his envisaged message, pointing out both the economic and ecological aspects of net harm. In doing so, he seems to make sure that both sides of the greater *net harm* network of implications and properties are triggered, helping his audience correctly conceive his intended message through the use of textual context (co-text).

Furthermore, it can be observed in this same BBC interview how even in the case of very concrete facts the interpretation of properties and/or implications of lexical items can differ greatly. This is for example the case between Ridley and Toynbee, as Ridley states that "it's gonna be 70 years before we see any harm from climate change […] The models have clearly got things wrong, […] they didn't predict that climate change would be as slow as it has" (0.25-0.41). Toynbee responds, stating "70 years is a short time, I've got young grandchildren, that's not very long" (1.59-2.04). This goes to show how even a very concrete single fact, 70 years, can cause some issues when used by socio-culturally different interlocutors. Although there is apparent agreement on the duration of 70 years when considered for its absolute (true) time value, the perception of 70 years in relative time can differ greatly as people's backgrounds differ. Ridley, mostly looking into harm done in financial terms, seems to find 70 years a lot further away than Toynbee, as she primarily focusses on human aspects such as the wellbeing of next generations. From this it can be seen that even though there appears to be a large overlap in the understanding Toynbee and Ridley express with regards to the concept "70 years" in terms of its purely 'descriptive' value, its properties, there are already some discrepancies between the implications they attribute to this concept, causing interpretative differences.

It seems inevitable that if people can already disagree over some of the (seemingly subjective) connotations of a fairly straightforward fact such as a 70-year (absolute, true time) timespan, more abstract concepts and especially terms such as the ones coined in the beginning of this introduction or the term *net harm*, as used in two fairly distinct connotative realms by Ridley, can pose even greater problems as the level of mutual agreement on the connotations of any specific lexical item and its semantic value might lose even more ground to the amount of individually perceived implications and properties that are not mutually shared. Then, if the field of agreement becomes too small, and discrepancy between discussants with regards to terminological semantics grows the resulting, possibly confusing and vague, use of terminology that is influenced by diverse and individualized semantic judgments might become a source of communication problems.

On a more academic and theoretical level examples of (the possibility of communicative risks as a result of) individual semantic judgment discrepancy is also perceivable. A great illustration of this can for example be found in Michael Toman's article discussing the meaning of *sustainability*, as he argues that:

> for ecologists "sustainability" connotes preservation of the status and function of ecological systems; for economists, the maintenance and improvement of human

> living standards. Disagreement about the salient elements of the concept hamper determination of appropriate responses for achieving sustainability (p. 3).

With this, Toman points towards the possible existence of alternative interpretations of the term *sustainability*, which are much alike the different interpretative backgrounds Ridley suggests with regards to the term *harm* (1.15-1.33). The interesting link between these two terms is that both are fairly abstract terms which have rich connotations to them, that are both used in the environmental debate. From this it can be suggested that the combination of a high level of abstraction (leaving room for interpretation) combined with a diverse set of discussants (with different life philosophies/worldviews) might be an especially fertile soil for discrepancy between individuals and/or the social groups these individuals belong to in the semantic judgment of terminology.

Both practical examples and theoretical discussions of the issue of possible miscommunication or at least degeneration and/or skewing of intended messages through individual differences in the judgment of the semantic value of relevant terminology by discussants in the environmental debate can be found. Interestingly, a combination of more practical examples of actual use on one hand and theoretical discussions of said use on the other, for example in the form of a thorough case study, is much harder to find. A corpus study would offer the opportunity to link actual examples of natural use to more theoretical models, but still appears to be missing. Therefore, this paper will be aimed at contributing to filling this gap.

The core goal of this paper is to find both theoretical backing for - as well as practical examples of the existence of individual and/or group differences in terminology perception suggesting the possibility of skewing and/or degeneration of messages or even miscommunication. The expectation is that ground for such communicative problems exists, being the result of discrepant, or in the worst case possibly incompatible, individual and/or group differences in perception and interpretation of terminology in the environmental debate. In order to justify these statements, first a discussion of relevant and neighboring theories and academic works will be offered. This leads to the creation of a schematic model representing the options for individual/group-based interpretation of lexical items in general, and terminology in specific. Furthermore, a brief theoretical investigation into the question of how terminology-based risks of miscommunication in debate issues might be minimized is offered, suggesting the use of intralingual intersemantic translation. After this an investigative qualitative case study in the form of a discourse analysis of samples of environmental issue-based discourse in a formalized setting is conducted.

The case study performed is a textual analysis of the practical use of the key term suggested by Toman, *sustainability*. For this, a diverse set of speeches delivered by several main players in the international environmental debate on the political level is analyzed. The main aim in this analysis is tracking down and explaining instances of use of the term *sustainability* or a variant of it in which the speakers knowingly or unknowingly suggest and/or leave open, or overtly aim to minimize room for the skewing, degeneration, or misinterpretation of the intended message based on the audience's personal interpretation of utterances in text and context. In order to dissect such instances of use the analysis will especially be focused on the direct and indirect (textual) context of instances of use of the term *sustainability.*

Together, these research steps are aimed at answering as well as briefly following up on the following question: Are there theoretical as well as practical signs for the existence of instances of individual and/or group-based terminological semantic judgment discrepancies concerning the usage, interpretation, and/or prototypes of the term *sustainability* in the environmental debate?

2.1 Theory: Lexical Semantics, Prototype Theory, Categorization, and Beyond.

In its essence the aim of this paper's overarching theoretical background can be fit quite neatly into the field of lexical semantics: there is a focus on the semantic value of specific terms, which are essentially just a subgroup of lexical items. From a dictionary point of view this means that the description of the terminological lexical items would match up correctly with the core of this research, as can for example be seen when looking at Katie Wales's description of the term lexical semantics in her *dictionary of stylistics.* As a sub-discussion in the "semiology, semiotics; also semantics" entry (p. 354-356) she states that: "Lexical semantics has traditionally studied the different sense relations of words […]; and also sense components or features and semantic fields" (p. 355-356). There are no conflicts between this explanation and the goal of this paper any whatsoever, however what misses in this definition is the link lexical items have to those who utter them, and to their general broader contextual links to the world. A missing link in Wales' description of lexical semantics that she, interestingly, does hint toward in her general description of semantics just before, as she points out that semantics has been "much influenced by philosophy and logic" (p. 355).

This missing link in Wales' description of (lexical) semantics is one that is all but new, as John Firth for example already stated in 1935 that "the complete meaning of a word is always contextual, and no study of meaning apart from a complete context can be taken seriously" (qtd in Requejo, 2007, p. 170) in a paper that is interestingly called *The Technique of Semantics*. This opinion concerning the influence of "complete context" on a word's meaning is still a valid point of discussion in modern day linguistics, as for example Ray Jackendoff discusses a much more recent, cognitive approach to semantics, stating:

> Conceptual Semantics is concerned not only with encoding word meanings but also with accounting for (a) the combination of word meanings into phrase and sentence meanings, (b) the character of inference, both logical and heuristic, and (c) the relation of linguistic meaning to nonlinguistic understanding of the world, including the aspects of understanding provided through the perceptual systems (2007, p. 411).

From these two quotes it becomes apparent that the line that separates traditional semantics as being the study of language in its linguistic context (represented by (a) in Jackendoff's reasoning) from pragmatics as the study of language in its non-linguistic context (represented by Jackendoff's (c)) is fading, as modern cognitive approaches to language increasingly judge these two contexts as inseparable. Therefore, it might not be seen as surprising that

Requejo for example suggests that "cognitive linguistics does not separate linguistic from encyclopedic knowledge, or even semantics from pragmatics" (p. 172) and later comes to the conclusion that "it is impossible to distinguish between semantics and pragmatics when it comes to the study of a real language event" (p. 177). This is for example also discussed by Janssen, who in an interview held for the occasion of his retirement as a university professor states that meaning is a situational procedure, and that over time pragmatics has increasingly become the focus of language study. Janssen even goes as far as to say that he believes semantics and pragmatics essentially coincide, and that what is called semantics is often in fact pragmatic work being executed (in Boogaart et al, 2006, p. 13-14). For this paper too the distinction between semantics and pragmatics will not be made in the traditional sense, as (the understanding and creation of) semantic meaning of language is increasingly attributed or at least linked to non-linguistic contextual features, making linguistic and non-linguistic context two inseparable sides of the same coin. This justifies merging semantics and pragmatics into one greater study of language in both its linguistic as well as its non-linguistic context. As for example discussed by Janssen, semantics appears to be generally used as the umbrella-term for the all-encompassing understanding of the combined terminological aspects semantics and pragmatics entail, and in this essay that convention will be followed. Therefore, from now on the use of the term semantics in the context of this paper represents the broader, combined understanding of semantics and pragmatics. Traditional use, and with that distinction, of the terms semantics and pragmatics will however occur in works that are being referenced or cited in this paper, and in this case the authors' terminological choices will be followed.

Katie Wales' dictionary discussion of lexical semantics, although not explaining the link between semantics and non-linguistic context, does offer an interesting, yet other direction. Wales discusses a new trend, which "deals with prototypes and 'fuzzy' concepts: the idea that concepts can be classified with reference to a 'central' type, but that category membership is graded, and boundaries between concepts are 'fuzzy'" (p. 356). What she seems to point at here is a set of already existing theories of categorization and prototypicality (Lakoff, 1987; Rosch, 1978). A connection that does not come as a surprise, since these subfields of cognitive linguistic research are very closely linked to lexical semantics. Furthermore, the theories concerning prototypicality and categorization add greatly to the theoretical background of the paper's aim, as they fill in some of the gaps left in Wales' definition of lexical semantics. Theories of categorization and prototypicality are in this sense especially interesting to investigate and establish the possibility of user- and

context-based interaction between terminological lexical items and the properties and implications these items represent from a semantic perspective.

For example: in his explanation of a specific aspect of categorization, why and how near-synonyms can enter each other's semantic realms and become interchangeable in certain communicative situations, Dirk Geeraerts states that "stylistic, sociolinguistic, connotational expressivity [and conceptual needs] may determine the flexible use of a category" (Geeraerts, 2007). As a result, the prototypical potentialities of a lexical item can be stretched and more peripheral forms of usage of a lexical item might become more accepted or standard. With this Geeraerts suggests, among other things, that categories and the location of lexical items within them are not set in stone: they can be altered by all sorts of, to a degree, external factors. Although Geeraerts primarily uses this reasoning to show how different lexical items can move into each other's semantic area (p. 183), it coincidentally explains how a single lexical item may represent such a rich set of prototypical and more peripheral forms of usage that different users move so far away from each other's semantic interpretation of specific terminology that they judge the same lexical item to represent semantically skewed, discrepant or even incompatible properties and implications.

Lakoff's idea on categorization and prototypicality also seems to leave room open for a theory of discrepant and/or incompatible individual and/or group-based semantic judgments within lexical items, as he states that "the properties that are relevant for the characterization of human categories are not objectively existing properties […]. Rather, they are 'interactive properties', what *we* understand as properties by virtue of our interactive functioning in our environment[… ,] not objectively existing properties of objects completely external to human beings" (2007, p. 131). So categorization is a conventionalized human process rather than one that is entrenched in the human mind, as it is at least in part based on external and experiential factors such as embodiment and enculturation. When applying this to the categorization of rather abstract terms it seems logical that in such cases where the possible realm of connotative values of any given concept is large and diverse in nature, individual speakers, or possibly socio-culturally connected groups as a whole, may categorize the same lexical item, even in the same instance of use, differently as a result of differences in their personal (socio-cultural) upbringing and environment.

The core difference between Lakoff's statements and this paper, as is also true for Geeraerts, is that where they both focus on conceptual categorization between lexical items, the focal area of this work is the categorization *within* lexical items, and *between* individual users and/or socio-cultural groups. However, even with this difference it seems that

Geeraerts' and Lakoff's ideas concerning the categorization and creation of prototypical examples seems to hold on an intralexical level just as good as on an interlexical level, at least when focusing on the philosophies of cognitive processing that Geeraerts and Lakoff present on one hand, and the alternative interpretation this paper presents on the other. This is a viewpoint confirmed by Lakoff as he states a list of what presupposed certainties about categorization should be left behind, ending with: "all people think using the same conceptual system" (1987, p. 9). The fact Lakoff discards this presumption does, in itself, proof that his ideas on categorization are open to the possibility of individual differences in meaning-making processes, possibly resulting in individually differing semantic judgments of the same lexical items and their attributes.

The issue of single lexical items having multiple meanings and the implications that come with this has also been discussed very extensively by cognitive linguist Vyvyan Evans, in his book *How Words Mean* (2009). Interestingly, this work supports a great many of the propositions made about the realm of possible representative values of words in the discussion of most previously discussed theories. In fact, in his book Evans seems so much in agreement with most theoretical aspects discussed in this essay that it could be suggested he set many of the ground rules and concepts necessary to suggest the presence of differences in the individual/group-based intralexical item perception. These ground rules are for example clearly set apart in Evans's discussion of the process of selecting the right word meaning in certain instances:

> Selection relies on a number of constraining factors to determine the appropriate lexical concept: the lexical concept which best fits the conception under construction [...]. Once a lexical concept has been selected, it must be integrated with other selected lexical concepts of the utterance, and, if it is an open-class lexical concept, interpreted in the light of conceptual structure to which it affords access, and the other open-class lexical concept(s) with which it has been integrated (p. 218).

It is but a small step from this explanation to the idea of the possible existence of (ground for) communicative problems through individual and/or group differences in semantic judgment of any given lexical item (Evans's 'lexical concept' is in essence the same as the semantic interpretation of any given utterance of a lexical item by any given speaker/audience member). One merely has to combine it with Lakoff's statement that not all people use the same conceptual system (1987, p. 9), and it already becomes apparent that the process of identifying the actual intended message in any given utterance of a given lexical item is one that can differ per individual, resulting in different outcomes.

Furthermore, Evans's statement raises another issue: context is regularly needed to help individuals choose the correct meaning representation of a lexical item in certain instances of actual use. It seems logical that if such context is not given (sufficiently), this might result in individuals mainly if not solely referring back to their own understanding of the lexical item at hand to further the process of making sense of an utterance, rather than having contextual information to help judge the utterance's (intended) meaning correctly. In such a situation of lacking information, it might be fairly logical that people with different conceptual systems and backgrounds might ascribe different meanings to the same utterance of the same lexical term.

It is important to add that a short discussion of the terms message and meaning is in place. There is a trend to divide *meaning* as a concept up into multiple types of meaning, as for example done by Keller, who discusses *meaning* and *sense* as two separate concepts. In works such as Keller's, it can be seen that a division is made between dictionary and/or prototype meaning (*meaning)* and meaning in contextual use (*sense)*. The use of *meaning* in the context of this essay encompasses both these forms of meaning, which is a direct result from the idea that semantic (traditionally seen as denotative) and pragmatic (traditionally seen as connotative) meaning are inextricably linked, and don't exist apart from one another. Rather, in this paper *meaning* is used to describe this broad understanding of both meanings. The term *message* is used in roughly the same way, with the important addition that it solely functions to represent the (intended and/or received) connotative meaning of specific utterances in use, whereas the term *meaning* will at times also be used to describe a higher level of meaning, which as it were combines multiple possible *meanings/messages in specific use* to form a network of meanings that surpasses selected usage instances.

A great example of how the aforementioned theories are applicable in practice, especially to the environmental debate, can be found in Michael Toman's article discussing the problems with using, interpreting, and describing the meaning of the very term coined in this paper's introduction as the subject of analysis: *sustainability*. Toman argues in his introduction that "for ecologists "sustainability" connotes preservation of the status and function of ecological systems; for economists, the maintenance and improvement of human living standards" (p. 3). He furthermore discusses how *sustainability* means many things to different people, and suggests that this is the case for many, as he calls them, evocative terms. This concept of evocative terms is for example also discussed by Temmerman (2011), who explains evocative language as being language use that is "potentially rich in connotations" (p. 50) but restricted by some important attributes: it is "culture- and language-bound" (p. 55).

She points out that "the evocative power of language can be an asset and a liability at the same time" (p. 59). This is a conclusion she draws on the overarching idea that the use of terminology is often culture-bound, based on rich connotations and metaphors, and that as such it offers a lot of language enriching opportunities, but also communicative pitfalls (In this sense evocative language shows many links to vague and/or ambiguous language, something which will also be discussed later on in this paper)[1].

Temmerman discusses her philosophy on the theoretical discussion of terminology as follows: "terminology studies and translation studies should join forces with linguistics and intercultural studies in trying to better understand the assets and liabilities of multilingual intercultural communication" (p. 59). In essence, this statement is fully true. However, it is interesting to see that Temmerman seems to link, as she does throughout the article, multilinguality and interculturality as two almost inseparable concepts, something some of the theories discussed earlier in this theory section (e.g. Lakoff, 1987) don't tend to confirm. It might therefore be logical to add that Temmerman's ideas on the possible benefits and risks of using evocative terminology count not only in multilingual situations, but also in situations in which interculturality exists within a group consisting of members that speak the same language.

This first investigation goes to show that, although thorough case studies are still lacking, at least on a philosophical-theoretical level the issue of communicative risks due to (socio-cultural) differences between interlocutors, possibly even within the same language community, has been acknowledged. Even more so, it has been recognized in relation with the term used for the case study in paper: *sustainability* in the environmental debate.

[1] Interestingly, the term *evocative* appears to be quite vague too. Toman for example uses the term in the context of specific terminology, Temmerman uses it in a broader context of metaphors, and both leave plenty of room for interpreting other instances of language use as being evocative. It appears that evocativity, as a language trait, can be attributed to a wide variety of linguistic utterances, as long as some ground rules of evocativity as for example presented by Temmerman are met.

2.2 Theory: Building a Model for Individual/Group Semantic Judgment

A visualization might help further structure and detail the theoretical background of the proposed expectations concerning the way different individuals/groups deal with the same lexical items. For this, one might best turn to Lakoff's discussion of radial categories (1987, p. 91-114) as this specific theory combines more or less all features of categorization necessary for explaining a theory of variation within a lexical item, with the core difference being that Lakoff employs it to discuss the categorization of (partly) differing lexical items. However, the core aspects of categorization are fully transferrable: There is a main category involving prototype effects, which are the effect of the category's make-up: the category is radially divided into more centralized as well as less centralized subcategories, the latter of which are extended forms of meaning which are not necessarily specialized versions of the prototype or more centralized subcategories, but can be better seen as variants (p. 91).

When transferring these features from the categorization of lexical items to the categorization of features within one specific lexical item, it takes but a minor addition to make it fit. This addition is the idea that for any individual, and on a more general level any socio-cultural group these individuals are a part of, the (instance of use of a) lexical item (to be seen as the main category, with all its more and less central subcategories) will have part of, but not all meaning representations ('meanings') captured within itself. Any individual will attribute certain more central and less central properties and implications (to be seen as more and less centralized features within the main category) to this lexical item. However, all the attributive features applied to any term by any given individual, or even by any given specific group, at any time, will together always be but a subset of all possible attributes. It are one's embodied and encultured experiences as well as the context of the utterance that are expected to affect the creation of associative networks, resulting in differing meaning attributions per individual. This would in fact also happen in the interlexical item situation as originally shown by Lakoff, as one can for example argue that Lakoff's example of *mother* as a radial category (p. 91) would have different connotative variants to different people and in different contexts (some might not see a biological mother that gives up her child as a mother at all, others might not see a lesbian adoptive parent of her partner's child as a mother, and when things get more abstract and metaphorical as people start talking about concepts such as 'mother earth' the question of whether one can justifiably categorize this term into the motherhood category might get even more complex.).

For this it seems justifiable to assume that when applying Lakoff's ideas concerning radial categories to variety within lexical items one can expect that not all connotative parts of any lexical item apply to all individuals. This is, in essence, not too much of a problem, as many of these sub-features are non-exclusive and not necessary to understand more central features of the item. However, a problem might occur when the differences in individual understanding of the properties and implications of any specific item become so extensive that different people's semantic judgments of the use of any given lexical item start moving further away from the intended message. In theory, this could in extreme cases result in situations where the common ground between several individuals and/or groups on the semantic value of the (use of the) lexical item becomes too narrow to have them recognize each other's interpretation, and with that each other's use, of the main lexical item to a mutually satisfactory level (That is, all parties involved understand the intended properties and implications of the given lexical item in the given utterance to an extent in which individual and/or group differences concerning the semantic judgment don't cause degradation and/or skewing of the intended message in the process of interpretation).

A model for individual intralexical item semantic judgment should, based on the aspects and parameters just discussed, look something like figure 1 (see next page). In this model a lexical item (the thick-lined black circle) is represented as a radial category (as represented by the thin black circles within the thick circle). Within this item, an undefined amount of more central (closer to the center of the circles) and more peripheral (closer to the thick outer circle) connotations (represented by dots) can be found.

By connotation the following, as described in the Oxford online dictionary entry for 'connotation', is meant: "The abstract meaning or intension of a term, which forms a principle determining which objects or concepts it applies to". Important to add is that this interpretation of connotation in this essay also involves what is traditionally understood as denotation. This is a direct result of the suggestion that semantics and pragmatics coincide, because suggesting that linguistic context and non-linguistic context inevitably interact in the process of meaning-making automatically leads to the expectation that what is traditionally known as denotative meaning and connotative meaning interact and coincide in several ways. This inevitable combination of denotative and connotative meaning can for example also be found in Lakoff's work on categorization, as he states that "the properties that are relevant for the characterization of human categories are not objectively existing properties […]. Rather, they are 'interactive properties', what *we* understand as properties by virtue of our interactive functioning in our environment[… ,] not objectively existing properties of objects completely

external to human beings" (2007, p. 131). These properties Lakoff discusses can be seen as the denotative meaning, and the interactivity and subjectivity revolving around these properties are what is generally seen as the connotative meaning. Interestingly the Merriam-Webster dictionary definition of connotation links to three specific entries: the entries for implication, signification, and property. The property-related entry reads: "an essential property or group of properties of a thing named by a term in logic — compare denotation". However, when one goes to the denotation entry one of the definition entries reads: "the totality of things to which a term is applicable especially in logic — compare connotation". From this it becomes clear that for this dictionary too denotation and connotation inevitably coincide, as the applicability of a term to a 'thing' will always be dependent on 'essential properties or groups of properties' of that same 'thing'. There is no possibility of denotation without using connotations in order to justify denotative choices. This issue has for example also been pointed out as early as 1929, by Russian Linguist Voloshinov, who stated that "the separation of word meaning from evaluation inevitably deprives meaning of its place in the living social process (where meaning is always permeated with value judgment), to its being ontologized and transformed into ideal Being divorced from the historical process of Becoming" (p. 105), further pointing out that referential meaning is inevitably "moulded by evaluation" (p. 105). A view that appears to be shared, for example, by Wittgenstein[2]. From this it becomes clear that the separation of denotation and connotation, as is the case for semantics and pragmatics, can be seen as one that might be of theoretical use, but in practice appears somewhat artificial. Following this reasoning, then, the use of connotation in the context of this paper will represent a broader concept, that includes what is traditionally known as denotation.

In practice, these 'broad connotations' can be said to be made up of two of the concepts hinted to earlier on: properties and implications. Once again, the (in this case Oxford online) dictionary entries for these terms can be used to further concretize the use of these terms in the context of this paper. With property, the following is meant: "An attribute, quality, or characteristic of something". Implication, on the other hand, stands for "A likely consequence of something". In this sense, the implications can be seen as a consequence and/or result of the properties, and together these traits (properties) and their possible effects

[2] Following Wittgenstein's Meaning as Use conception (p. 43), as he for example states that "[the] general notion of the meaning of a word surrounds the working of language with a haze which makes clear vision impossible. It disperses the fog to study the phenomena of language in primitive kinds of application in which one can command a clear view of the aim and functioning of the words" (p. 4).

(implications) make up a network of features (connotations), which in their turn can be seen as the building blocks for meaning creation.

So for example in the case of the lexical item *fire*, some properties would be that it is hot and that it uses some sort of fuel as well as oxygen to stay burning. Implications would be that fire can hurt you and that fire will die out if it lacks fuel and/or oxygen. These properties and implications (together with many others) make up our understanding of the connotations, and (a selection of) these combined connotations in turn makes up the meaning(s) of the lexical item *fire.*

In the model, the thick-lined circle can be seen as the accumulated set of all possible properties and implications the people, as a collective, can have with regards to the lexical item at hand. Any given individual (represented by the blue, green, and red circles) will associate instances of use of the lexical item with certain, but not all of these connotative features. As a result, there will be a certain amount of overlap (represented by the parts where the blue and green, respectively blue and red circles overlap) between the properties and implications attributed to any given lexical item between any two individuals, as well as a certain amount of connotations that are not shared by both individuals (represented by the remainder of the circles). In the case of a socio-culturally uniform group of individuals it can be expected that the semantic judgment of a lexical item relevant to the specific group's common ground is to a large extent similar. Thus the connotative circles (in this case blue, green, and red) can also be used to represent (socio-culturally uniform) groups rather than individuals.

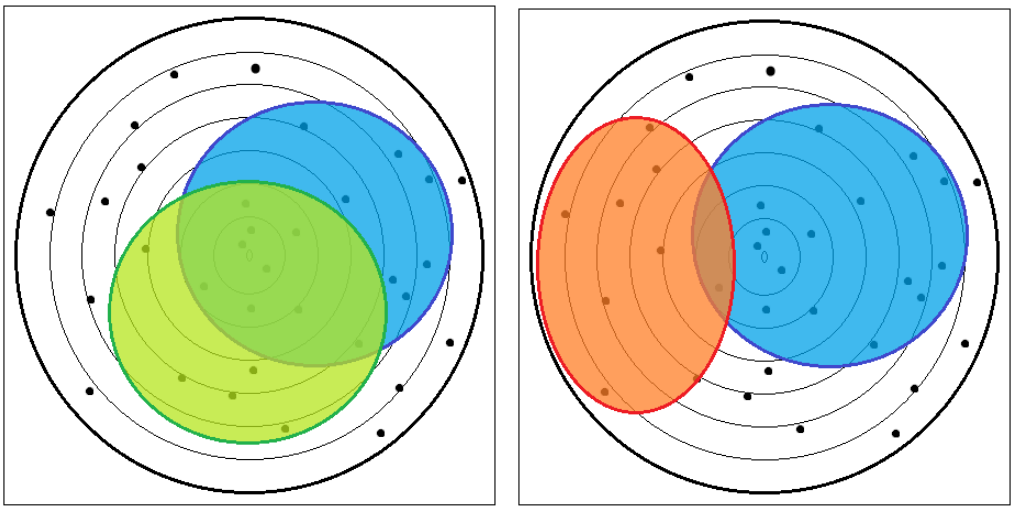

Figure 1. schematic examples of overlap and individual differences of the perception of connotations (represented as dots) of a specific lexical item in use. Left an example of 2 individual (blue and green) property and implication representations that overlap for most of the more central features, on the right a situation with far more differences of personal property and implication associations for a lexical item between individual 1 (blue) and individual 2 (red).

Of course, this is but a schematic model. The full amount of properties and implications that people can possibly attribute to a lexical item can probably not be mapped objectively and all-inclusively. The same goes for the amount of overlap needed between two individuals and/or groups for a general agreement about the lexical item at hand to be in place. In both these cases the problem lies within the fact that the process of meaning-attribution to words can be expected to be a complex, cognitive process based on embodied and encultured experience (Lakoff, 2007, p. 131) as well as context, which can probably never be accessed consciously to its fullest. Furthermore, it has to be stressed that the intended/perceived message cannot only differ between individuals or groups, but also between different instances of use by the same individual, as context is also of high importance in the process of meaning-making. Despite all this the schematic model offered in figure 1 can, and should, be seen as a concrete depiction of the differences in the individual/group-based intralexical item semantic judgment, and as such can help link theory and practice.

2.3 Theory: Intralingual Intersemantic Translation as a Solution

In his discussion of the seeming incompatibility of differing individual property and implication attributions to the term *sustainability* Toman offers multiple solutions, such as refining the concept, or extending ecological and economic theory (2006, p. 6). A different solution, 'intralingual translation', is not mentioned, even though this alternative has already been proposed over 2 ages ago. Theologician and Philosopher Friedrich Schleiermacher already pointed out that the incompatible socio-cultural backgrounds of discussants can be a cause for failed communication even if they speak the same language in the introduction of his influential work on translation: "Über die Verschiedenen Methoden des Übersetzens" (Schleiermacher, p. 41), which was published as early as 1813. Interestingly, in modern times intralingual translation has been discussed and researched, but mostly with regards to other forms of intercultural translation, such as the translation of outdated, historical texts into a modern version (Vlachopoulos; Albachten) or translating one geographical dialect variant of a language into another one, as for example translations from British English into American English (Pilière).

Academic investigation into intralingual translation as a possible means to raise the understanding and cooperation between people with different socio-cultural backgrounds seems to be a mostly untrodden path. Yet, such an approach might be at the foundations of finding a valuable solution for socio-culturally driven communicational degeneration and/or even failures. When looking at a definition of intralingual translation, as for example offered in 1959 by Jakobsen, it becomes clear that it contains all the ingredients for finding a solution to individual/group-based semantic judgment differences of lexical items: "Intralingual translation or *rewording* is an interpretation of verbal signs by means of other signs of the same language" (Jakobsen, p. 233).

In fact, a more sensitive approach to the individual differences in the judgment of semantic properties and implications of terminology would fit into one of the main strategies in the field of persuasive communication: the coactive approach. Intralingual translation would for example tick many of the boxes offered by Simons and Jones in their listing of components of coactive persuasion: it is "receiver-oriented, [largely taking place] on the message recipients' terms; it is situation sensitive, recognizing that receivers […] respond differently to persuasive messages in different situations" (p. 124) just to name a few. As such, intralingual translation can be seen as a tool to help increase the effectiveness of communication for both/all parties involved in a communicative act. It is important to keep

this in mind during any textual analysis of instances of differences in semantic judgment of terminology, as some utterances might have the theoretical potential to create communicative degeneration and/or skewing of the message at hand, but a speaker can have already solved this by using this coactive technique, hence ‘avoiding the problem’.

An approach to discourse closely related to this ideal of coactivity is that of renowned sociologist and philosopher Jürgen Habermas who, among others such as Karl-Otto Apel, offers a more philosophical view on the workings of discourse in the theoretical discussion of what is formally called discourse ethics. One of his main works on this issue is the book *Moral Consciousness and Communicative Action*, which was published in German in 1983 and in a somewhat extended version in English in 1990. As the name of the book already suggests, discourse ethics is the philosophical treatment of discourse from a moral perspective. From this point of view, it adds an important side note to the idea of optimizing communication: it is a moral choice that is, as the link to Simons and Jones’s ideas on coactive persuasion also suggests, not a necessity.

However, if speakers would wish to create a coactive discussion that would maximize gained consensus through deliberation, Habermas believes they can and should do so, but only if certain strict rules are followed. Some of the most important rules he implements in his theory of discourse are borrowed from his colleague Robert Alexy, a jurist and legal philosopher. The rules Habermas borrows are as follows:

> 1.1 No speaker may contradict himself.
>
> 1.2 Every speaker who applies predicate F to object A must be prepared to apply F to all other objects resembling A in all relevant aspects.
>
> 1.3 Different speakers may not use the same expression with different meanings (p. 87)

Interesting in light of this paper are especially rules 1.1 and 1.3. Rule 1.3 is clearly and directly linked to the main theory behind this research, as it focusses on the possibility of single expressions containing multiple meanings that can be used in such a way that they create vagueness, not offering the correct tools to all parties involved that are needed to deduce the intended and/or received semantic message correctly. However, rule 1.1 is also highly interesting, because one might say that the use of vague terms can be, in a sense, a deliberate form of contradicting oneself.

This also becomes apparent from the dictionary explanation of the term ‘contradiction’ as offered in the oxford online dictionary, in which the main entry is: "A combination of statements, ideas, or features which are opposed to one another" which is

supported with the example "*the proposed new system suffers from a set of internal contradictions*". What this example shows is that the contradiction, so the combination of opposing ideas or features, can be internal to something. In the case of this specific example ‘internal’ in the sense of being within the proposed new system, but as has been established earlier on in the theoretical section of this paper such an internal combination of opposing ideas and features can also be present within a single term. Thus, the use of a term that represents a wide variety of semantic properties and implications, possibly resulting in communicative vagueness, when not thoroughly made clear through the speaker’s direct and/or indirect context, can in fact be seen as a case of self-contradiction, as it is the (possibly deliberate) creation of an internal contradiction. One might for example use the term *sustainability* in such a manner that, for the listener, it is nigh impossible to determine whether one hints towards the economic, social or environmental semantic properties and implications. Thus a sentence like ´sustainability is our absolute number one priority´ in its core holds the potential to represent the contradictive statement ´economic sustainability is our absolute number one priority and environmental sustainability is our absolute number one priority´. For this it can be stated that rules 1.1 and 1.3 are in fact partially collapsed into each other and add to each other’s conceptual problem definition.

2.4 Theory: Summarizing the Problem and the Solution

To summarize, the existence of differences in individual and/or group-based semantic judgments of the meaning of terminological utterances can be backed up by closely related research in the field of cognitive linguistics, such as for example theories of categorization and prototype theory. Furthermore, these theories can be used as a starting point in an attempt at explaining why and how these semantic differences come into existence. A possible solution for individual semantic differences in terminology use can be found in intralingual translation, which has been suggested before as a solution to practically the same issue and which has all the traits needed to minimize miscommunications, but which has not yet been elaborately researched as a means of solving the specific issue of individual terminological semantic judgment differences. This can be seen as somewhat surprising since it suits the communicational situation perfectly and also fits directly into already existing theories of how to achieve successful communication and maximum persuasive power.

However, as seen in the discussion of Habermas's approach to discourse ethics the avoidance of vagueness as a result of the use of terms with multiple meanings is an act that needs to be constrained by certain rules. First of all, such translation would have to be created through the application of certain ground rules to one's choice of words: it might help to make sure that speakers, or their text writers, pay sufficient attention to naming, wording, rewording, and where necessary adding explanatory 'side notes' in the form of elaborating or using surrounding words (co-text) that explain or stress meaning. Next to this, it has to be an actual moral decision, a choice of the speaker, to be coactive. In terms of intralingual translation this would mean that the speakers translate themselves, but the key question is of course whether this coactive approach is deemed desirable by the speaker. If this is not the case an alternative might be having someone else 'translate' their message into another form, which is for example done by journalists and teachers.

As this paper's focus lies mostly on the theorization of the possibility of skewing and/or degeneration of messages through the use of semantically vague and/or ambiguous terms, and applies this to a study of actual speaker's use of the term *sustainability* in practice, the intralingual translation by '3rd parties' such as journalists will for now not be further investigated. However, the textual analysis following later on in this paper will discuss instances in which speakers can be identified as intersemantically 'translating' their own use of terms. In this analysis, special attention will be paid to the strategies speakers apply to clarify and take away vagueness, and these strategies will be linked to the ideas on the

theories concerning intralingual translation introduced in this section, such as those of Simon and Jones, and Habermas.

3. Corpus: Speeches on the Environment

The environmental debate is not only diverse in terms of subjects and participants, but definitely also in terms of discussion platforms. Debates about environment-related issues can take place online, in a scientific setting, or in politics, just to name a few. As for this paper, the focus will lie on the latter. Firstly, because it can be expected that in politics the socio-cultural background and group affiliation of discussants is fairly identifiable through their formalized political affiliations. Next to this, it might be expected that in politics there is a balance in which both being truthful as well as being persuasive come into play, making it a very rich form of communication which involves some balancing, causing extra reasons for creating, or avoiding, terminological vagueness.

As for this paper's main goal, the ideal corpus would be made up of a (set of) head-to-head debate(s) between two or more politicians with a comparable scope of influence and power, and opposing socio-political ideologies. Interestingly, relatively recent examples of such debates are scarce. Characteristic of this is for example the complete lack of any substantial debate on the issue of climate change in all three official presidential debates between Obama and Romney in 2012, as for example reported on by Brad Plumer in the Washington Post and Suzanne Goldenburg in the Guardian, the latter pointing out that this is the first time in 25 years that climate change is not mentioned in any of the debates at all. She especially refers back to the 2008 Obama - McCain presidential debates, which when one looks further into them feature merely one question and about half a dozen more brief one or two sentence mentions of climate issues spread out over about 45.000 words of text uttered in three subsequent debates (Commission on Presidential Debates). This suggests that even when discussed, climate change is but a minor topic in the presidential debates in the United States. Further investigative research into other English-speaking political systems wistfully suggests that the cause for the actual presence of any readily available video, audio, or text material on instances of substantial environmental political debates is not much better in the rest of the world.

Luckily, there is an alternative. A rather extensive amount of speeches that fully focus on or at least elaborately discuss environmental topics is readily available in the convenient form of readymade transcripts (See appendix for transcripts). Although not optimal, the speeches still suffice in offering examples of terminology use in a formalized context involving 'interlocutors' (addresser and addressees) with different socio-political backgrounds. Through a qualitative linguistic analysis such a corpus can still offer insights

into possible vague messages conveyed, discrepancy between those messages, and the option for (over)hearers to choose the ‘correct’ or ‘incorrect’ meaning of an utterance.

There are, of course, those who disagree on the idea monologues are suitable for discourse analysis. German philosopher Jürgen Habermas for example states that "the justification of norms and commands requires that a real discourse be carried out and thus cannot occur in a strictly monological form, i.e., in the form of a hypothetical process of argumentation occurring in the individual mind" (p. 68). However, from his wording something important becomes apparent: real discourse is not strictly monological, but Habermas cleverly adds the example of monological discourse as hypothetical argumentation in the individual mind. From this it can become clear that speeches, as utterances offered to an ‘other’, an audience which is able to respond, should not necessarily be seen as strictly monological. In light of this essay’s analysis it might be suggested that instead one may see speeches as parts of dialogues that are extended over time and space. Thus, as stated before, speeches might not be the most straightforward example of a dialogue, and with that not the optimal corpus, but they are workable and readily available, making them the most convenient option for an honest, balanced discourse analysis.

In order to select a corpus that is on one hand well-balanced and uniform, and on the other hand offers enough raw material for analysis, some choices have been made. First of all, all speeches selected have been uttered in English. This is vital since the analysis of specific terms calls for all instances of usage of said terms to be in the same language, rather than offering an analysis of translated variants, mainly because it can be expected that even though translations of a term might be available, there is no objective way of checking whether the parameters of usage and representative value of the translated term are anywhere near similar to its counterpart in another language. Furthermore, even the use of English terms as ‘imported words’ in speeches delivered in another language is excluded from this research, since once again a term used as an ‘exotic’ (L2) lexical item within an utterance may have different connotations for speakers and/or listeners than the usage of the same term has in an L1 context.

Furthermore, all selected speeches are delivered by political figures that have, or have had, a leading role in the political field they operate(d) in. However, the contexts in which the speeches are delivered differ (from formal political settings such as international conferences to talks for businesspersons, and a university speech). The key interest is not creating a set that was uniform in context, but rather one that was uniform in topic: environmental issues. Any unwanted noise in the results will be filtered out as much as possible through the

involvement of direct and indirect context of all separate speeches in the analysis. Furthermore the differences in setting and audience might even help explain differences in the usage of terminology, which in itself could yield interesting results.

Lastly, all speeches selected have been delivered in the 21st century. The choice for 21st century speeches only is based on the possibility of a change in (political) meaning of words over time, as well as in the general tone of the greater environmental debate. For this, a line had to be drawn, and it has been drawn at the turn of the century for matters of convenience: the speeches needed to be given in the same *zeitgeist* as much as possible, but enough useful speeches had to be included in the corpus to make it workable.

In the analysis the speeches will be presented by the name of the speaker and the year in which they were delivered. Full transcripts of all these speeches can be found in the appendix.

4. Method: A Multi-leveled Discourse Analysis

In the case of interpreting individual/group judgment of terminology semantics and the effects this can have on the communication process a multi-faceted analysis that discusses both text and context, for all participants (active and passive) involved in the speech act, is a necessity. In order to offer a view on communication on all these different levels and for all these different participants Norman Fairclough's conceptualization of communication appears especially appealing, even though originally specifically meant for a power-relations based textual analysis.

In his work *Language and Power*, a discussion of the theoretical background of Fairclough's critical discourse analysis, he discusses communicational acts as follows: "[The process of social interaction includes the final text, but also] the *process of production*, of which the text is a product, and the *process of interpretation*, for which the text is a resource" (p. 20). Basically, Fairclough criticizes more traditional, mostly text-based, discourse analysis strategies for their focus on a mere part of the interactional act, rather than the whole. Instead, he suggests looking at communication at multiple levels: text, direct communicational context, and a more indirect social context. He argues that all of these levels interact and help shape each other (p. 20-21). In essence this means that Fairclough suggests that in order to fully understand a communicational act multiple levels of discourse-based analysis have to be performed: not only a textual analysis, but also an analysis of direct contextual factors surrounding the communicational act, such as setting and audience, and an analysis of more indirect social contextual factors such as important international conferences taking place elsewhere before, during, or after the analyzed speech is delivered, as they might influence the topic and tone at hand.

For the analysis in this paper a similar structure will be applied, albeit loosely. At the most detailed level a textual analysis will be offered. This analysis of terminology in use, in this case *sustainability*, will for the largest part part be based on an analysis of the possible effect of the textual syntactic and lexical environment of the fragments (co-text) selected for analysis. Through the use of this analytical tool it becomes possible to see if the pragmatic message that the speaker wants to bring across through the use of a select set of words appears to be uniform, ambiguous, clear, or vague. This approach closely linked to Bruce Fraser's works on pragmatic markers, who describes his approach to linguistic pragmatics as follows:

> I take pragmatics to be an account of the process by which the language user takes a sentence representation provided by the grammar and, given the context in which the sentence is uttered, determines what message and what effects the speaker has conveyed. My concern in this paper is with a part of that process namely, the ways in which the linguistically encoded information of sentence meaning provides an indication of the direct, literal messages intended by the speaker (p. 167).

Although Fraser focusses mainly on tag questions, sentence starters, and personal notes, as is indeed the focus to be expected when one is researching pragmatic markers, the context of this specific essay calls for a somewhat different approach. The assumption to be added is that what counts for the effect of prototypical pragmatic markers such as tag questions and sentence starters on the intended message in an utterance is also true for terms richer and more complex in form and meaning. For this, a special interest will lie in the interpretation and analysis of lexical items surrounding the term *sustainability* that are relatively complex in terms of meaning representation, often terminology, jargon, or at least more situation-specific lexical items, that in many cases show a fair deal of abstraction. However, much like in Fraser's work, the assumption is that through an interpretation of the broader textual context of any given utterance, in this case the context of the specific lexical item *sustainability* or a variant of it, one can deduce the 'direct, literal message(s) intended by the speaker(s)'.

From Fraser's story it seems that what he means with "direct, literal message intended by the speaker" (p. 167) can be roughly interpreted as the intended semantic connotations of a message. Closely related to Fraser's ideas on retracing intended meaning is the work by Colombo, Tabossi, and Job, who indicate the following:

> The process of accessing a lexical ambiguity can be affected by prior context. In fact, a sentence priming an aspect of one meaning of an ambiguity renders lexical decision on a visual word referring to that aspect significantly faster than lexical decision on a word referring to an aspect of the contextually inappropriate meaning of the ambiguity (p. 164)

Although their work focuses on stereotypical cases of unbalanced lexical ambiguity (words containing dominant and subordinate meanings that differ strongly), and they find that the dominant word associations cannot be fully eliminated through the process of sentential priming, it is clear from this work that the use of lexical items in the direct (sentential) vicinity of a lexical item appears to trigger those properties and implications of the lexical item at hand that it shares with its direct lexical environment, its co-text.

Lexical ambiguity is a trait that is sometimes attributed to the term *sustainability*, as for example discussed by Kaj Bärlund, former director of the environment and human settlements division of the United Nations economic commission for Europe, as he states that there is "a cloud of ambiguity hanging over the concept of sustainable development" (interestingly, Bärlund especially focusses on the combination of sustainability and development in his discussion of the diversity and ambiguity of said term, which is in fact made up out of the two independent terms *sustainability* and *development*. An issue that will also be discussed later on in this paper). However, the same ideas on terminological ambiguity and diversity also apply to the stand-alone term *sustainability*, as for example Stuart Hart states: "To be sure, sustainability's ambiguous and multidimensional nature can be maddening at times, yet is also one of its greatest attractions from a business perspective" (p. 60). However, Two important notes have to be made in order to extend Colombo, Tabossi and Job's statements concerning lexical ambiguity to the case of *sustainability*. First of all, for *sustainability* the different associative fields (e.g. environment, economy, and society; Strange and Bayley, *Sustainable Development*) do not appear to follow a distinct 'pecking order', making it a 'balanced' ambiguous lexical item. Second, it has to be noted that there seems to be some discrepancy between the way in which Hart and Bärlund attribute ambiguity to the term *sustainability* and the traditional linguistic use of the term ambiguity in the context of lexical items as it is for example used by Colombo, Tabossi, and Job.

This second issue might be solved through the idea that in practice ambiguity, polysemy, and vagueness form a continuum without clear boundaries, as for example discussed by Tuggy (1993), and Geeraerts (1993). In this continuüm ambiguity forms one end of the spectrum, concerning issues in which the multiple meanings of a lexical item are fully disconnected from each other, and vagueness forms the other end as it entails cases in which the multiple meanings of a lexical item are closely related, sub-categories of the same greater meaning as it were. Polysemy is said to fall in between, with meanings that are clearly distinguishable, yet related (Tuggy, p. 273). However, use of the term ambiguity such as Hart's and Bärlund's in the context of *sustainability* is also defendable. Vital in this is that some linguists go even beyond linking vagueness, polysemy, and ambiguity as if they are part of a continuum. Especially interesting in the context of this paper is a statement by Brugman and Lakoff in a paper discussing the English word *over*, as they state: "Polysemy is a subtype of lexical ambiguity" (p. 477). The idea that polysemy, such as in the case of the different meanings of *sustainability*, can result in lexical ambiguity will be followed in this paper.

Hence, when *sustainability* is discussed as being ambiguous in this essay, it is meant to be seen as a case of polysemy that results in lexical ambiguity.

Meaning selection in the case of lexical items that portray balanced (lexical) ambiguity in use is, interestingly, a much less discussed topic than unbalanced or interlingual ambiguity. However, some insights can be gained from an influential work by Schaneveldt, Meyer, and Becker (1976), who in an extensive case study suggested that the *selective-access hypothesis*, the idea that meaning-making of ambiguous words is triggered by congruent textual context, co-text, appears to be the most probable theory to explain people's semantic judgment of balanced ambiguous terms. About this they state that their findings "suggest that a related context restricts the meaning accessed in recognizing ambiguous words" (p. 254). Although more recent research that especially focuses on cases of balanced ambiguity (which is vital for the case of *sustainability*) appears to be missing, theoretical agreement with Schaneveldt, Meyer, and Becker's findings can also be found in more recent work, such as in the introduction of Vuong and Martin's work on the resolution skills of lexical ambiguity in patients with damaged left inferior frontal gyrus (2011), as they state the following:

> In the case of balanced ambiguous words, each of the equally associated alternative meanings receives an equal amount of activation from the ambiguous word form and prior disambiguating context serves to boost the activation of the intended meaning above that of unintended ones, allowing the intended meaning to be selected immediately as a balanced ambiguous word is processed (p. 22)

Clearly, by lack of a sufficient amount of quantitative researches on the issue, and the cognitive processes behind it, the jury is still out on the case of intended meaning selection in the specific case of balanced ambiguous words. Furthermore, the focus so far (e.g. Schaneveldt, Meyer, and Becker; Vuong and Martion) appears to lie primarily on classic and very concrete examples of ambiguity (e.g. the stereotypical example "bank" as either a financial institution or a riverside). However, it seems fair to suggest that, for balanced lexical ambiguity at least, meaning selection is affected by congruent terms in the sentential context of an utterance, as they help prime specific aspects of the ambiguous term at hand. Following Brugman and Lakoff's idea that polysemy is a subtype of lexical ambiguity, it seems fair to suggest that for *sustainability* selection effects due to co-text are fairly similar to those of more stereotypical cases.

Based on these assumptions the analysis is largely based on the idea that co-text surrounding *sustainability* can, and probably will, affect the way audiences judge the semantic value of any given utterance of the term *sustainability* in practical use. This is in

line with ideas and findings on the *selective-access hypothesis* on finding the intended meaning in utterances involving balanced ambiguous terms. However, an important reservation to make is that this is by no means a law that goes without exception. Quite on the contrary, as for example Degani and Tokowicz strikingly put it: "Even in the same task, ambiguity is not resolved in the same way by all individuals. Rather, because it is a difficult aspect of language processing, ambiguity resolution emphasizes differences among individuals that may otherwise go unnoticed" (p. 1285).

In fact, more general discussions in modern theories and philosophies of the human mind's individual differences ideas on the ways physical, cultural, ideological, and many other forms of environments can influence people are also available. This theoretical field is one that seems to be considered in many studies of (human) life, such as linguistics, philosophy, psychology, neurology, among others, as for example bundled by Andy Clark in his work *Supersizing the Mind: Embodiment, Action, and Cognitive Extension.* What can be retrieved from Clark's work in light of this essay is that from both linguistic and other fields concerned with the human mind, it seems logical and fair that the way language use is interpreted is also, at least in part, an individual activity and/or process, one that is influenced by one's (in this case political) environment. In cognitive linguistics this idea is also present, as for example shown by Lakoff's rejection of the statement that "all people think using the same conceptual system" (1987, p. 9).

Thus the qualitative nature of this research poses a problem insofar that certain speech acts might have other intended meanings/actual results achieved than those registered in the analysis, as this analysis uses the analytical tools provided by an ideal hypothetical model (*selective-access)* and discusses a limited amount of speakers. This can be seen as a weakness in the research set-up, but one that is not an unsurpassable hurdle in the following analysis, especially because of its investigative nature. Possible ways of dealing with this specific issue in possible future, more evolved analyses are discussed in the suggestions for further research.

From the analysis of textual features it is a fairly small step to the contextual discussion, which will be divided into two parts. First of all the direct communicational context, which entails the direct setting in which the selected speeches are being delivered (e.g. audience, media presence, type of event). Next to this the broader social context will be touched upon where necessary, focusing on factors that are not directly present at the actual speech performance, but that might still be expected to affect it (e.g. recent related news events, political campaigns). However, in order to offer a truly complete picture and to start

filling in the broader contextual aspects of the environmental speeches to be discussed the analysis will start with a brief discussion of the issue at hand: the environmental debate.

5.1 Analysis: The Environmental Debate in a Nutshell

In order to correctly place the speeches discussed in the analysis in a broader context, a short introduction of the environmental debate as a whole is in place. Of course, such a discussion has to be extremely selective in order for it not to become one's lifework in its own right. For this, a special and concrete focus in the following introduction will lie on the nature of the environmental debate, especially in the 21st century, rather than its overall history, scientific background, and other aspects that are surely of relevance, but are best discussed in another context than that of this specific research.

It can be stated that in the past decades the climate debate has first and foremost been a political and scientific issue, typified by treaties and proposals that bind these two parties. Maybe the best example of this is the Kyoto Protocol (1992), which goes to show the shared political, economic, and scientific nature of the issue through its nature, its form, and its purpose. However, more recently it appears that the climate debate has moved away from playing a major role purely in politics, economy and science to becoming a much more mainstream issue, in which many more parties are involved. This is for example also discussed in the introduction of the book *Environmental Argument and Cultural Difference,* published in 2008 and written by political scientists and sociologists Edmondson and Rau as they argue:

> In recent years environmental debate has moved from the margins of public and political life to occupy a key position in discussions on the political, social and economic prospects of the human world. Unprecedented media coverage on central environmental problems such as climate change and biodiversity loss has accelerated a dramatic shift in how we view our physical environment and our role within it. (p. 11)

This specific work focuses on some interesting aspects of the environmental issue: it is one in which many participants with different political, social, cultural, and economical backgrounds are situated, all with their own ideas, wants, and needs. Interestingly, Edmondson and Rau argue that these ideas, wants, and needs are oftentimes driven by one's cultural background, and that as such they may find their origins in issues that do not seem to be all too closely connected to environmental issues at first hand (p. 32). This seems fair, as for example arguments of tradition, finance, and history can easily find their way into the environmental debate even though they might not be the issues most closely linked to the environment.

Maybe the best way this idea is portrayed can be found on the book's back cover, as it reads: "Environmental argument is 'about' far more than meets the eye. How people (mis)understand each other during environmental debates is affected by conflicts between values and ways of life which may not be directly connected with the environment at all" and "[this] book makes visible the effects of cultural difference on people's approaches to arguing itself" In doing so, Edmondson and Rau raise, and answer, multiple interesting questions, which are once again neatly summarized on the back cover for the reader's convenience:

- If public arguing is shaped by specific habits of feeling or imagination, how does that impact on theories of democracy?
- Do we need new kinds of arguing to cope with environmental crises?
- What elements of arguing are decisive in the ways people come to see environmental decisions as wise choices?

These questions tell a lot about the nature of the environmental debate: It is a debate in which people with radically different backgrounds take part, and these backgrounds help shape their beliefs on the issue of the environment. Furthermore, the first question posed suggests that the environment is, at least nowadays, a topic that is directly linked to the heart of one's identity, as the shaping of opinions is suggested to be closely linked to habits of feeling and imagination. An important effect of this nature of the environmental debate is shown in the second question: How should one argue about an issue on which people are so divided, on which personal interests differ so greatly, and in which so many are involved?

The issues raised by Edmondson and Rau are in fact much in line with the issues discussed in the theory section of this essay, as Rau argues in the context of a case study about transport issues in Ireland that "encounters between members of different mobility cultures during (controversial) transport projects are often prone to intercultural (mis)understandings, though these may be neither immediately observable nor directly expressible by those involved" (p. 121). This statement about different cultures clashing over controversial topics as a result of intercultural (mis)understandings is one that can easily be lifted out of the context of the case study at hand, and serves as much if not more value as a general statement.

The solution that Rau suggests for this kind of misunderstanding is also close to that offered in the theory section of this essay, as Rau argues that the different positions in environmental disputes can best be visualized through "culturally sensitive sociological inquiry, mediation, and other forms of deliberative intervention, such as ethnographic investigations", which might "assist the resolution of [environmental] conflicts and

misunderstandings, at least to some extent" (p. 121). This suggested solution comes very close to intralingual intersemantic translation, as proposed earlier in this paper.

From this brief introduction, the following can be concluded: At least in recent times, coinciding with the main interest of the research part of this paper, it appears the environmental debate is one that is diverse in nature. People with greatly different functions, backgrounds, and interests take part in the greater environmental discussion, and it is an issue that appears to be, at least in recent times, one of great interest and importance to many. As such, the issue raises important questions about the way in which it should be debated, dealt with, and possibly solved. On this last point, Edmondson and Rau offer some suggestions that are very close to those made in the discussion of the possibility for intralingual translation as a solution as posed earlier in this paper.

To find if, and how these issues are dealt with in real instances of environmental debate, and to see whether strategies to avoid miscommunication on the topic have been applied, only one option is viable: a case study. As discussed earlier in this paper, this case study will revolve around the term *sustainability*, Thus, the next step in this analysis consists of the linguistic and non-linguistic contextual discussion of several real-life speeches on environmental issues such as climate change.

5.2 Analysis: Tony Blair, 2004: Multiple Uses of 'Sustainability' in Concrete as well as Abstract Terms.

The speech by English Labour Party politician Tony Blair, delivered in 2004 (see appendix), wins by a landslide when it comes to the amount of times the term *sustainability* or variants of it are used. In his, admittedly long, speech of 3800 words Blair uses the term over twenty times, significantly more than all the other speeches discussed in this essay. The greater context of this speech is best introduced by Blair's own introduction, as he starts by stating: "the 10th anniversary of His Royal Highness' Business and the Environment Programme marks what is now recognised as the premier international forum for exploring sustainable development in the context of business" (l. 9-11), referring to the Prince of Wales's Business & Sustainability Programme. This program is portrayed as one of Prince Charles's charity projects on the government's Prince of Wales website. In the description it is typified as "the leading international, cross-industry and cross-sector, forum for sustainable business" aimed at "the successful management of change through understanding global trends and finding strategic, practical ways to integrate social and environmental solutions into decision-making processes whilst still remaining profitable". The main audience is said to be international business leaders and corporate senior executives.

This background offers some important insights into the context of Tony Blair's speech: It is aimed at an audience that is interested in sustainability in both the environmental as well as the financial sense. Furthermore this audience consists mainly of professionals that can be expected to have a certain level of background and insight in the broader environmental debate. This audience background seems to match up with Tony Blair's use of the term *sustainability* in his speech, as he uses it in a variety of forms.

The first three cases in which Blair uses the term *sustainable*, all occurring in the first two paragraphs of his speech, are all combined with the word *development* (l. 10-11, 13 ,15). The feeling the combination 'sustainable development' gives is one that focuses mainly on the business side of sustainability, a feeling that is confirmed by the co-text of the first time Blair uses the term as he talks about "exploring sustainable development in the context of business" (l. 10-11). This seems to suggest a main focus on the business-side of the properties and implications of the lexical item *sustainable*, as the use of the congruent word 'business' underlines the context of management and profitability in which the program Blair speaks for is situated (following the *selective-access hypothesis).*

However, this is not the only way in which he applies the *sustainability* terminology, as right after his introduction Blair discusses the danger of greenhouse gasses and global warming, stating: "by unsustainable, I do not mean a phenomenon causing problems of adjustment. I mean a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence" (l. 36-39). Quite clearly, the use of *unsustainable* in this quote is moved a far stretch from the business-language concept of the term. In this instance Blair focusses fully on the environmental and human aspects of the *sustainability* concept, as hinted towards with word groups such as ‘destructive power’ and ‘human existence’.

Interestingly, Blair seems to be fully aware of this shift, as he overtly moves away from the main business goals of the Prince of Wales sustainability program by introducing his *unsustainability*-statement with some personal remarks. He introduces his opinion with "tonight I want to concentrate on what I believe to be the world's greatest environmental challenge: climate change" (l. 21-22), and somewhat later says "to summarize my argument at the outset" (l. 26). It seems that Blair wants to stress that his personal view on sustainability is, in this sense, much more focused on the environmental aspects of the term than on the business terms.

Later on in his speech Blair once again stresses his focus on the environmental part of sustainability as he states "we need to develop the new green industrial revolution […] that above all can show us not that we can avoid changing our behaviour but we can change it in a way that is environmentally sustainable" (l. 225-228). The addition of the contextually congruent word *environmentally* is important here, as it suggests that he wants to stress that he is not talking about the business-like side of *sustainability*. He, in a sense, adds a disclaimer that might be necessary for his audience, as they are first and foremost businesspersons, not environmentalists. This idea is further strengthened by a statement about housing that Blair makes somewhat later in his speech, as he says that "the economic and social case for new housing is compelling. But we must also ensure that our approach is environmentally sustainable" (l. 258-259). Once again special stress lies on the restrictions Blair places on the application of the broad term *sustainability*.

A schematized depiction of the situation can be found in figure 2 (see below). In this schema, three core lexical items are represented: *Sustainability*, *Environment*, and *Business*. Part of the possible properties and implications people can have with regards to these lexical items (in use) coincides, either between any two of the terms, or between all three, as seen in the overlapping areas in which the three black circles cross. In this area other properties and

implications, such as in the area where all three categories cross for example the *durability* property, might be situated. (Even though it has to be pointed out that this connotation is also, in its own right, a lexical item with radial categories of connotative features, which will once again show overlap with both the *Sustainability* and the *Environment* category. This meaning link can be extended indefinitely, as the understanding of any lexical item will be closely linked to one's understanding of a large set of other terms).

In this specific situation, Blair's connotations with the term s*ustainability* in the context of this speech is portrayed by the blue circle. All his connotations with the term stay within the *Sustainability* category, but there is a lot of overlap with the *Environment* category and slightly less so with the *Business* category. For his audience, Businesspeople, depicted by the red circle, the *Sustainability* concept may be slightly closer linked to the *Business* category than to the *Environment* overlap in general use. As can be seen, there is overlap between Blair's contextual connotative understanding of the term *sustainability* and the presumed prototypical understanding of the same term by Businesspeople, but there are also connotations that are exclusive to one group. What Blair does by overtly stating that he is talking about environmental *sustainability* is focusing the attention on this possible discrepancy between the connotative realms of the parties involved, and the fact that he talks about the term in his connotative realm, embedded in the greater context of his speech, rather than about his audience's presumed version of the same term.

However, even if the instances where Blair overtly discusses his focus on the environment suggest a special focus on this side of the *sustainability* category, most instances of the use of *sustainability* are in the context of 'development', as the words coincide directly next to each other nine times, and with only one word in between once more. This might be due to the background of Blair's audience, and the occasion of his speech, as the focus of the occasion clearly revolves around the link between the s*ustainability* category and the business category. It is, however, clear that in the case of instances of more *environmental* use of *sustainability* Blair brings the term closer to himself and his own understanding of the term through self-references and the explicit use of contextually congruent markers such as 'environmental' (suggesting an exoticizing effect for his audience that calls for further explication) than when he uses the term in the more business-related sense.

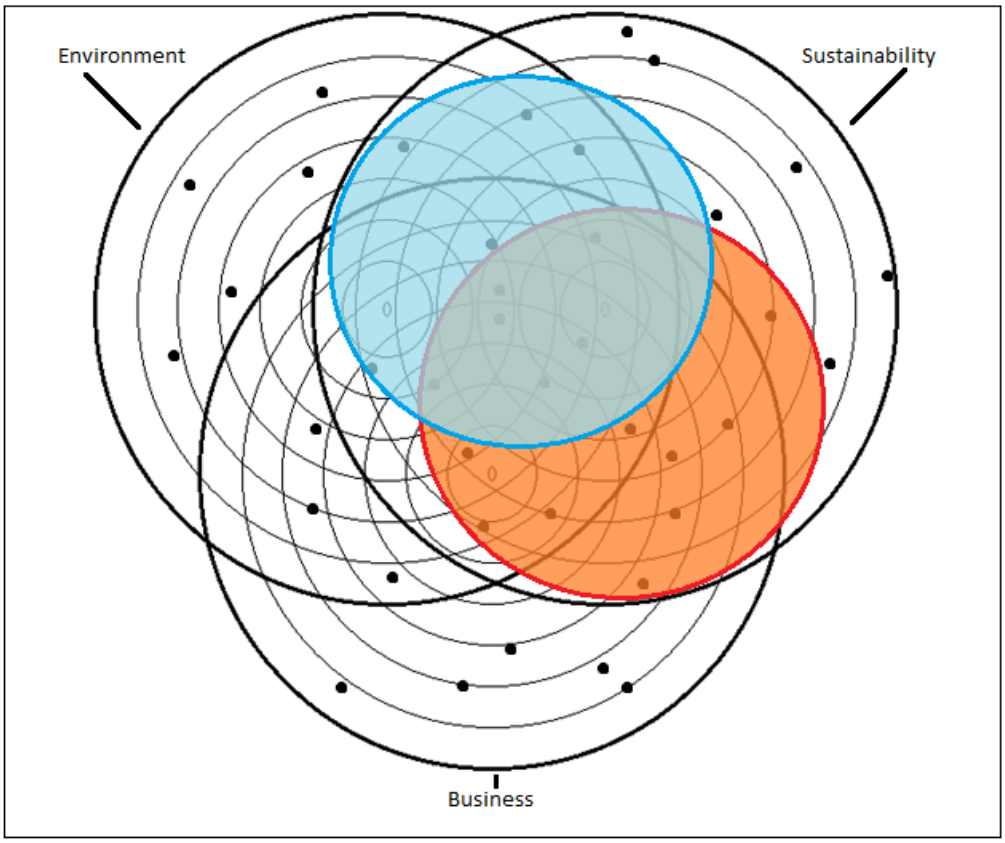

Figure 2. schematic examples of overlap and individual differences of the perception of connotations (represented as dots) of the lexical item 'sustainability'. As seen in the figure these properties and implications can overlap, in part, with those one might have with other lexical items such as 'environment' and 'business'. In this situation the contextual connotative understanding of the 'sustainability' term is mapped for Tony Blair (blue circle) and the prototypical connotative understanding of the same term for Businesspeople (red circle). The positioning of these connotative circles is based on the expected understanding of the term by the different parties involved based on, among others, their social, demographic, political, and/or occupational background.

Overall, it feels as if the main focus Blair places on the *sustainability* concept is the developmental side of the term, a process of progress. This might not be surprising when looking at the audience his speech was aimed at. Interestingly, however, there are also multiple instances in which he focusses much more on the pure environmental side of *sustainability*, rather than the financial and productive aspects. In these instances, it seems that Blair uses contextually congruent marker terms such as *environmental* to stress this different form of usage and to trigger the environmental understanding of *sustainability* in his audience (*selective-access*), as well as bringing these instances of uses closer to his personal beliefs about *sustainability*. Furthermore, in some cases he directly stresses the fact that he is talking from a personal perspective, focus and belief.

As already discussed the repeatedly recurring focus on sustainable development can probably be explained from the direct context, as the main audience in this instance consists

of people involved in business. The focus on the more environmental side of *sustainability* might be explained through a broader context: Blair's political and personal beliefs, as a leader of the central-leftist Labour party and a great proponent of thorough action when it comes to environmental issues. A belief that is for example strongly pointed out by David Sandalow, who among other occupations has held the position of executive vice president of the World Wide Fund for Nature (WWF), as he recalls:

> [One of Blair's trademarks is his] willingness to challenge his American friends on the environment—in particular on global warming. During his 1997 visit, Blair delivered a high-profile speech with a thinly-veiled criticism of "great industrialized nations" that fail to reduce greenhouse gas emissions. Six years later, Blair stood before a joint session of Congress and told American legislators that climate change "cannot be ignored," insisting "we need to go beyond even Kyoto."

From these actions and quotes it might become clear that Blair appears to use the term *sustainability* in two main strategies: One that is highly adjusted and applicable to his audience in the specific speech's context at hand, and one that appears to be closer to his party's and personal beliefs. Interestingly, he seems to apply multiple strategies to keep clear which of these two 'versions' of *sustainability* he is applying at any given moment in his address.

The use of *sustainability* in the business and development sense, and the special marking of instances of use where Blair focuses more on the environmental part can, thus, be expected to be seen as a coactive move towards the audience, applying many of the aspects of coactive deliberation as posed by Simons and Jones (p. 124). Blair focuses on those aspects of the broader *sustainability* category that apply most to the audience, and offers a disclaimer in the form of a concrete addition of personal opinion and the insertion of leading terms such as 'environment' in the direct co-text of *sustainability* that help increase his audience's understanding of any context-wise atypical use of the term and bridge the distance between the audience's expected prototypical understanding and Blair's actual use of the term in the mostly environmental context, based on the idea that textual markers can help trigger certain aspects of the connotative realm of a lexical item (Fraser)(in this case *sustainability*), as supported in previous research and statements on intended meaning selection in the case of balanced ambiguity (Schaneveldt, Meyer, and Becker (1976); Vuong and Martin (2011)). So in this case it seems that Blair overtly uses words such as 'environmental' in such a way that it helps further the audience´s interpretation of *sustainability* in certain utterances towards the, contextually congruent, environmental aspects of the term. These aspects are as it were

primed through the co-textual ´trigger term´ environment, helping speed up and strengthen the audience´s (unconscious) judgment of the intended terminological properties and implications.

From this perspective, it seems that even though there might be the potential for the skewing and/or misprocessing of intended message reception in the process that goes on between Blair's utterances and the audience's interpretation, no great risks of miscommunication become apparent. Rather, it seems that Blair is (either consciously or unconsciously) aware of the need for strategies of coactive adjustment and elaboration, and adjusts his speech to these risks in such a manner that they are avoided at the very same moment he utters the term *sustainability.*

5.3 Analysis: George W. Bush, 2007 & 2008: Political and Economic Sustainability

The next speaker to be discussed is George W. Bush, former president of the United states (2001-2009) and representative for the Republicans. For Bush 2 speeches will be discussed: The oldest one is a speech delivered in September 2007 at a "Major Economies Meeting on Energy Security and Climate Change" (US Dep't. of State). The newer speech is one given at the White House Rose Garden in April 2008.

The last speech, the 2008 one, was delivered in Washington, a day before an important climate change meeting in Paris (l. 12-15). Although it is difficult to find what the exact audience at the speech was, Bush refers directly to members of his cabinet that are present in his introduction (l. 9-10), which together with the choice to have the address in the rose garden suggests at least a minimum level of formality and political interest. The speech itself shows two instances of the use of (a version of) the term *sustainability*. A somewhat meagre amount, but very insightful nonetheless.

Both instances occur at the end of the speech, and both are directly combined with the term *economically*, resulting in 'economically sustainable' (l. 217-218, 221-222). Especially the first utterance is interesting because of its broader co-text, as Bush states about the necessity of a shared approach to the climate issue after the Kyoto treaty expires in 2012: "this approach must be environmentally effective and economically sustainable" (l. 215-218). What makes this utterance so interesting is the use of the combination of 'environmentally effective' and 'economically sustainable'. Based on the *selective-access hypothesis* it seems that this specific utterance triggers both the environmental as well as the economic effects of sustainability, as both are suggested through the sentential context of this utterance of *sustainability.* Interesting, however, is that the term *sustainability* appears to stand apart from the environmental aspects, as these are directly co-textually linked to effectivity, whereas sustainability is more directly linked to sustainability. In this form it creates a division between the environment and the economy that almost seems to suggest a difficult interaction, typified by the direct contextually congruent use of *environmentally effective* and *economically sustainable,* suggesting two separate concepts. An opposition that cannot be found as such in more direct alternatives such as 'environmentally and economically sustainable and effective', in which the two terms are much more connected as being unmistakably connected to both suggested goals. Rather, Bush connects the term *economically* to *sustainability* and seems to use the word 'effective' to create what feels like a barrier or an opposition with regards to *environmentally.* To add, although not much can be

found on the extent to which word position in context priming plays a role in selective access, it seems logical that congruent items in the direct vicinity of terms like *effective* or *sustainable* have more effect on the selective meaning access than terms that are further away.

Such an interpretation suggests that George Bush's intended message in the utterances involving *sustainability* may overlap more with his understanding of the term *economy* than with the term *environment*, as represented in figure 3 (see below).

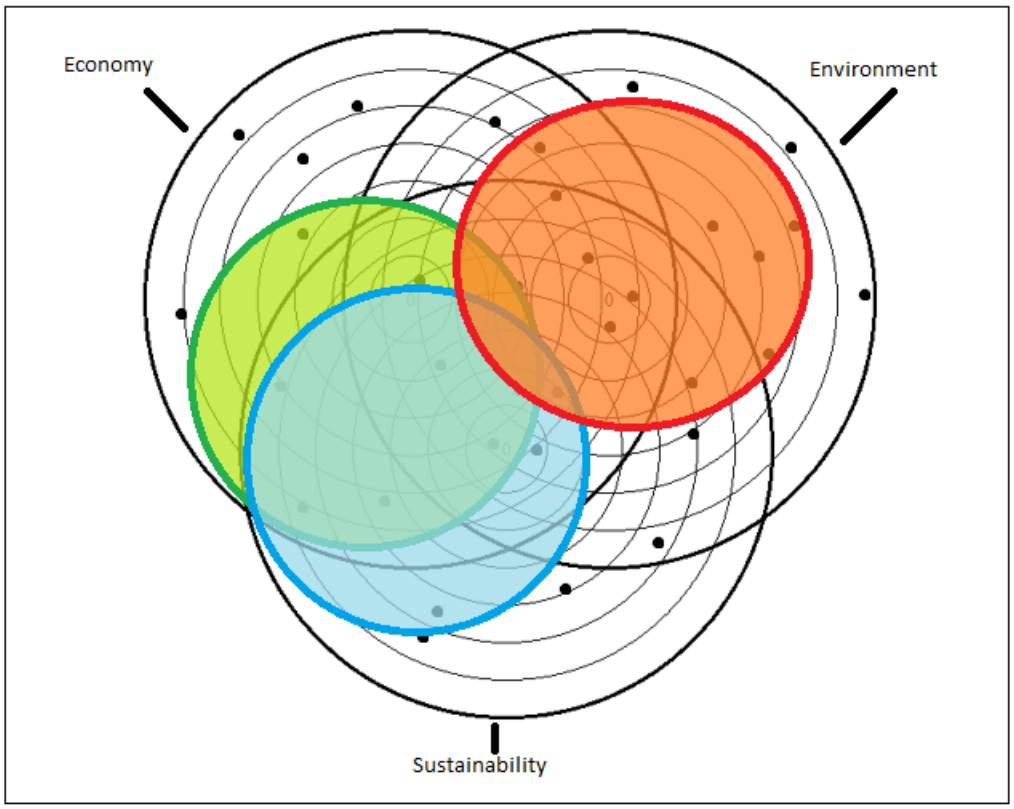

Figure 3. schematic examples of overlap and differences between the perception of three separate lexical items' connotations (represented as dots), in this case of the lexical items 'sustainability', 'economy', and 'environment'. The way in which bush uses the three terms suggests that his intended message concerning the properties and implications of the term 'sustainability' (represented by the blue circle), shows a lot of overlap with his expected prototypical understanding of the term 'economy (green circle). The environment properties and implications, on the other hand (red circle), appear to be placed fairly far apart from both the 'sustainability' and the 'economy' connotations.

The form of usage of the (versions of the) term *sustainability* by Bush as suggested through an interpretation of his 2008 speech can further be strengthened by an interpretation of a speech delivered a year earlier, in 2007, to representatives of major economies in a meeting on energy security and climate change. In this speech, three instances of (versions of) the lexical item *sustainability* appear, and one instance of the usage of the related term *sustains* might also be of relevance.

The first mention of *sustainability* once again, looking at its broader textual context, suggests a focus on the economic, and in this case also political, aspects of *sustainability*: "we can agree on a new approach that will reduce greenhouse gas emissions, strengthen energy security, encourage economic growth and sustainable development, and advance negotiations under the United Nations Framework Convention on Climate Change" (l. 29-32). Once again the congruent term *economy* is situated close to *sustainability*, in the context of an enumeration. Next to this it is important to note that, just like Tony Blair, Bush links the term to the lexical item 'development'. The created set, *sustainable development*, appears to be a recurring example of an extended term made up out of two separate terms, that appears to exhibit many of the same features of diversity and ambiguity that *sustainability* contains on its own (in accordance with theoretical discussions concerning the set *sustainable development*, e.g. Strange and Bayley; Bärlund; Hart,).

However, where Tony Blair also shows instances in which he links *sustainability* more to the environment, Bush almost purely sticks to the economic and political sense of the word. This can for example clearly be seen by the co-text of the other two times Bush uses the term *sustainability* in this speech, as congruent economic terms are in both cases abundantly present in the direct vicinity of *sustainability*. In the first situation Bush states that "[America is] investing millions of dollars to develop the next generation of sustainable biofuels like cellulosic ethanol" (l. 162-164), and the other mention of *sustainability* is as follows: "we're providing tens of billions of dollars in incentives for conservation. We're promoting sustainable public and private land-management policies" (l. 221-222). Clearly, in both cases the influence of the environmental aspects of *sustainability* is subservient to the economic and political aspects, as Bush surrounds the term with hard economic figures and concepts such as 'public and private policies', triggering selective access to the *sustainability* concept in his audience.

What might in part explain this main focus on economic aspects of *sustainability* is the topic of the conference this speech was a part of. As the focus lies on energy security and climate change, it may be expected that there is at least a certain focus on the parts of the *sustainability* category that overlap with the properties and implications of the energy security concept. However, this does not in its own right explain why there is hardly any reference to for example the social and cultural aspects of *sustainability* either. It seems that the intentions Bush has in his use of the term *sustainability* is, when looking at its co-text, simply mostly influenced by the economic and political realms of connotative properties and implications, even after taking into consideration the context of his speech, an energy security

meeting. This idea is further strengthened by Bush's use of the term 'sustains' in the following phrase: "energy sustains the world's most advanced economies" (l. 51-52). This suggests an understanding of the act of sustaining as something that is done to the economy by resources, and not vice versa (the economy having to adjust in such a way that it sustains the resources).

All in all, it can be seen that Bush's focus when it comes to the connotative value of his use of the lexical item *sustainability* lies mostly with the economic and political range of the category. In this, he differs on an individual basis from Blair, who also uses the term multiple times in the direct context of sustaining the environment, with much less focus on economy or politics. An important side note to make is that Blair too uses the term in a more economical sense in some instances, but all in all it is a more balanced and/or diverse use of the term than in Bush's speeches.

This seems to be in line with the differences in personal and political background between Blair and Bush, as where Blair is typified as a progressive speaker with a strong involvement and interest in the environmental issue from a rather ideological and environment-focused position (Sandalow) Bush appears to be his direct opposite: He is said to have a terrible record in terms of environmental policy, to put it mildly, seeming to prefer economy over the environment (Goldenberg, "The Worst of Times: Bush's Environmental Legacy"). This might cause Bush to have a more business-aimed prototypical understanding of the term *sustainability* altogether.

5.4 Analysis: Ban Ki-Moon, 2007: Sustainability as Sustainable Development

As briefly pointed out in the previous section both Tony Blair and George W. Bush link the term *sustainability* to the lexical item ‘development’ on multiple occasions, although to a somewhat different degree. From this perspective, it is interesting to briefly switch to an address offered by UN Secretary-General Ban Ki-Moon at the UN Climate Change Conference in 2007. From this, several contextual aspects of his speech can be deduced: The setting was formal, Ban Ki-Moon was in a position that calls for relative neutrality and moderateness as he represents all UN members, and the main perspective of those taking part at the conference will be a political one, much in line with the UN Kyoto Protocol. Furthermore, Ban Ki-Moon mentions that the meeting is taking place on Bali (l. 9), which is worth mentioning for completeness sake but doesn’t seem to call any concrete contextual side notes to mind.

In his speech Ban Ki-Moon uses the term *sustainable* three times. What makes the speech especially interesting in light of this research is that in all three instances he speaks of ‘sustainable development’ (l. 31, 58, 79) This suggests that Ban Ki-Moon’s understanding of the connotations of the term *sustainability* is fairly uniform, and that it is closely linked to the development category.

Furthermore, much like in Bush’s case, it seems that Ban Ki-Moon has a main focus on the economic aspects of *sustainability* rather than on the environmental aspects. This becomes especially apparent when taking the co-text into account. His first mention of the term is as follows: "it is our chance to usher in a new age of green economics and truly sustainable development. New economies can and must grow with reduced carbon intensity even as they create new jobs and alleviate poverty" (l. 30-33). Clearly, the term *sustainability* is much more surrounded by financially loaded congruent terms such as ‘economics’, ‘economies’, ‘jobs’, and ‘poverty’ than it is by *environmental* terms, although he does mention ‘green’. Ban Ki-Moon’s second mention of the term looks especially much like the first one in terms of its surrounding words, as it reads: "together, we can spur a new era of green economics, an era of truly sustainable development based on clean technology and a low-emission economy" (l. 57-58).

A somewhat different focus can be found in the third use of the phrase ‘sustainable development’, as it focusses not so much on economy but rather on social factors: "I recognise the actions in [lesser developed] countries through new national climate plans, policies and measures for sustainable development. I welcome these actions and urge that, as

indicated in statements made during these negotiations, they pursue their expressed intentions to do still more" (l. 77-80). In this statement, it becomes apparent that the 'sustainable development' Ban Ki-Moon is talking about is one that mainly focusses on a socially and politically loaded issue: the friction between the right for lesser developed (in the original text called non-Annex I) countries to gain wealth, and the need for them to keep from using highly polluting techniques and resources. So the economic aspect seeps through in this statement too, but does so in a much less direct sense and is subordinate to the social and political message conveyed by the use of the term 'sustainable development' in this context. However, it is worth noting that this does not necessarily mean that the focus on environmental aspects of *sustainability* is much greater, since these mainly seep through in the 'climate plans' word choice, without any other more direct mention of aspects and terms that are clearly and directly linked to environmental issues.

Combining these three instances of Ban Ki-Moon's use of the term *sustainable* and their broader textual context, it seems that his use of the term is rather narrow and uniform: in all cases the focus of the intended message appears to lie on (economic) development, as all utterances of *sustainable* are mainly surrounded by lexical items that show clear signs of congruency with the economic realm of *sustainability*, hence priming selective access in the audience. This suggests a clear direction in Ban Ki-Moon's understanding of the properties and implications of the term *sustainability* towards the financial, political, and developmental aspects of the greater *sustainability* meaning category. However, this meaning can only be deduced from a broad textual analysis as offered above, no direct or easily observable markers of such an understanding of *sustainability* are available in Ban Ki-Moon's speech in positions directly in front of or after the term *sustainable* (e.g. 'economically sustainable', or 'sustainable economy'). This raises the question whether an audience that just hears the speech once, without any transcript, would pick up on this. Furthermore, more instances of Ban Ki-Moon's use of the term, also in other contexts, would be needed to state whether this trend is typical for Ban Ki-Moon's prototypical idea of *sustainability* or whether it is (incidentally) his focus in this speech only.

At least it seems that Ban Ki-Moon is not overly concerned with the issue of ambiguity, as he makes no noteworthy attempts of self-explanation and -elaboration, like for example Tony Blair did by adding the concrete term *environmentally* to his *sustainability* use and pointing out that he was speaking for his own person, opinionated, in cases where he focused on the green aspects of *sustainability*. Interestingly, Tony Blair did not do so in the instances where he talked about 'sustainable development', just like Ban Ki-Moon didn't. A

possible explanation for this might be that they expect that their audiences, in both Blair and Ki-Moon's cases professionals that have influential positions in their respective fields (mainly economic and business professionals in Blair's case, politicians in Ki-Moon's case), have a prototypical understanding of the term *sustainability* that comes fairly close to their use of the term in the context of 'sustainable development'. In order to check whether there might be truth in this statement, it would be most interesting to turn to a speech delivered for a different type of audience, such as a political speech for a (potential) voting audience, resulting in a more diverse blend of laypersons and professionals all with their individual (dis)interests in the environmental, economic, durability, political, and many more aspects of *sustainability*.

5.5 Analysis: Prince Charles, 2011: Sustainability in all its Diversity

Sadly, speeches held by leading political figures that are aimed at a non-political and non-business public appear to be scarce, or at least incredibly hard to retrieve. For this, to get another perspective in the use of the term *sustainability* a somewhat debatable choice has to be made. The choice at hand is to focus not on the leader of a formalized political body, but rather on a speech delivered by His Royal Highness the Prince of Wales, Charles Mountbatten-Windsor. Although not officially part of the English political system, there are several good reasons to include his speech here.

First of all, it is unmistakably true that Charles has a special, highly influential role in the political system, keeping close ties with and recurrently meeting many political figures, albeit formally as a private person rather than as a politician (e.g. Quinn, "36 private meetings with cabinet ministers"). In fact, to add, these ties go so far that it has become a key aspect and item of debate surrounding Charles's role as possible future monarch. The Daily Mail for example suggests that many current actions of - and rumors about the Prince point toward the possibility of him become a more 'presidential' type of monarch, which would mean an important break with tradition (English, " 'Presidential' Prince Charles to break with tradition"). All in all, the choice to include a speech by Prince Charles in the broader discussion of addresses delivered by political figures is one that might be seen as atypical, but it is surely one that is defendable looking at Charles' role in formalized political systems.

Having established the appropriateness of including a speech by Prince Charles in a discussion of political speeches it is now time to turn to the speech itself. The address is one that was delivered in Cape Town, South Africa, in 2011. What makes it especially suitable is that it was a speech delivered at Cape Town University in light of the African Climate and Development Initiative. As a result of the placement of this speech at a university, some important expectations are raised: Rather than a mainly political or financial audience, it will probably consist of many members with a more scientific background. Furthermore, it can be expected that a fair proportion of the attendees most probably consists of young adults, an expectation that is at least partly justified by the fact that online reviews of the speech by young adult attendees can be found (e.g. Tshepi, "When Prince Charles came to Cape Town"). Thus, the demographics of this speech can be expected to differ to a fair extent from the speeches discussed in this paper so far.

Turning to the speech, it can be observed that in total sixteen instances of the use of the lexical item *sustainability*, a variant, or a clear relative are used (see appendix for specific

lines). Especially striking is the very varied form in which Charles, who in the discussion of Tony Blair's speech (held on the occasion of the anniversary of one of Charles's charities) has already been established as an active environmental advocate, uses the term. The following discussion will concern some of the most interesting instances of usage.

Like the previous speeches, there are instances in which the finance and economy aspects of *sustainability* can be retraced from its co-text, as for example in the following case of usage in the Prince's speech: "without [investments in agricultural education, training, and skills] it seems hard to imagine how a genuinely sustainable rural economy can be built" (l. 255-256). In this specific instance the economic aspects go hand in hand with more social and cultural aspects of agriculture, educating people to become self-sufficient, and rurality. Both add to the understanding of the intended meaning of *sustainability* in the context in which Charles uses it in this instance, and do so much more and more directly than environmental aspects appear to do from a co-textual point of view.

An interesting form of usage is "it seems to me that an important opportunity exists to bring together the narratives of climate change, sustainable development and economic stability (surely the very bedrocks of national security…)" (l. 258-260), which at first hand shows striking resemblance to one of the phrases used by George W. Bush: "economic growth and sustainable development" (l. 31). However, where the broader context of Bush's speech suggested a main focus on economic and political aspects, slight details make the Prince's use of *sustainability* in this specific utterance more well-rounded. The addition of 'climate change' in the sense of "bring[ing it] together with […] sustainable development" adds largely to this, as the enumeration makes it so that more focus lies on the climate, the environmental part of *sustainability,* and more specifically on the connection between the climate and sustainability. Furthermore, the choice for 'economic stability' rather than Bush's 'economic growth' feels like less strong an utterance, ascribing slightly less importance to the progression of economy to a higher level than Bush's utterance does. Moreover it could be argued that 'stability' is conceptually and ideologically closer to *sustainability* than 'growth' is. Lastly, the use of 'bring together' before the enumeration and the reference to all enumerated items in 'the very bedrocks' between brackets suggests a closer (inter)connection between the three lexical sets offered in the enumeration. As a result *sustainable* in 'sustainable development' calls into mind, next to the progressive movement suggested by development, properties of both financial stability and climate change. This makes the Prince's enumeration a very rich use of several abstract and/or core terms that as a result of Charles's wording add to each other's meaning, rather than competing for the main focus.

A very special form of usage of a *sustainability*-related term is the use of *sustaining* in "[areas rich in diversity of life are vital] if nature is to continue sustaining herself and, therefore, us." (l. 37-38) This specific type of use does not seem to trigger any economic, political, or even cultural properties and implications from the *sustainability* category. Rather, through the use of congruent terms like 'life' and 'nature' the focus lies on the environmental, even more so on the natural side of *sustainability*, in which nature is even personified and suggested to have an almost parenting role over humanity. This is a far stretch from most forms of usage shown so far in the previous addresses, which were all held in political and economic company by formal political leaders. Possibly it is Prince Charles's role, being formally not involved in politics, that gives him the freedom to show this kind of use, or it might be the context of a university in which scientists, and especially also students make up the audience. Although never fully objectively retraceable, it seems that one of these differences gives the Prince a freedom that cannot be found in the other speeches discussed.

A last interesting instance of the use of the *sustainability* item to be discussed is the following: "Traditional techniques also promise a degree of insulation from the ever more costly business of using fossil-fuel dependent, artificial inputs. Sustainable, agro-ecological approaches are the ones that could produce the sorts of diverse foods that Africa needs" (l. 210-212). In this specific instance the interesting finding is that *sustainable* does not link to growth or development of a higher level, but rather suggests taking a step back. This happens as the Prince suggests that 'traditional techniques' have benefits over more modern alternatives which are more expensive and use fossil fuels. It is interesting to see that in this instance *sustainability* is still discussed as something that needs a movement from one point to another, a change, to 'be'. However, where most instances of the use of items such as *sustainability* that refer to such a movement that have been discussed so far refer to a move upward, or a growth, with in the best case a more balanced or inhibited form of movement upward. Charles's example, however, goes way beyond that as it tips the scale: the move to *sustainability* is one that goes downward, back, towards traditional techniques. Once again a possible explanation can be found in Charles's role and the audience he addresses, as it can be imagined that such a message of moving backward and/or downward is much more accepted from a figure without a formal role in the political system. Furthermore such a message will probably be much more accepted by a public such as students and scientists, who have much less to (financially) gain and/or lose by a message of not only slowing growth down, but turning it into stepping back, than an audience made up out of politicians or businesspersons might do. Once again, these are suggested reasons that cannot be objectively

checked in an easy and concise manner, even though the logic does add up. An alternative might be that prince Charles, as also to be deduced from the existence of a pro-environmental charity program bearing his name, simply has a very environment-focused prototype of *sustainability* in mind.

5.6 Analysis: John Kerry, 2012: Combining the Extremes

A very interesting example of combining the multiple possible meanings of the term *sustainability* can be found in a speech delivered by John Kerry, current secretary, former senator and presidential candidate for the American democrats. The speech was delivered in the time that Kerry was a senator, but it had been long since his time as president. The main cause for Kerry's speech can be easily and straightforwardly deduced from the introduction to the speech transcript made available by the US Senate Committee on Foreign Affairs, which reads: "world leaders meet this week for the Rio+20 United Nations Conference on Sustainable Development (UNCSD), Senator John Kerry (D-Mass.), Chairman of the Foreign Relations Committee, delivered a major floor speech today urging U.S. action to combat the threat of global climate change" (l. 10-13).

The Rio+20 conference is an evaluative conference of the developments that have taken place in the field of climate change since the original Rio conference, which Kerry describes as follows: "Twenty years ago this month, a Republican President of the United States helped bring together all the world's largest economies in Rio to confront the issue of global climate change. The President was unequivocal about the mission" (l. 15-17).

Kerry, being very active in the field of climate change and environmental issues, and having been present at the original Rio conference as well as many conferences alike (l. 28-36), uses this international conference as a background to give a long address in the context of the US senate. From this it can be deducted that the direct audience was primarily made up out of American senators, although it has to be pointed out that as (fragments of) transcripts and videos also find their way to the general public this can be seen as a secondary audience. This is of course true for all speeches discussed, as all have been transcribed and put online (see Appendix), and most have been released in video format and/or discussed in news items as well. However, the example of Kerry is especially interesting since his speech takes places in national politics, which creates the probability of an important part of his secondary audience being part of the grand and for the larger part of laypersons consisting voting pool he and his party represent. Such a broad and general voting audience, which is very different in make-up from the more select and specialist audiences one can expect to be interested in UN meetings, university presentations and the like, plays an especially interesting and important role in national political systems (te Velde).

A very important reason this speech was selected for analysis and discussion in the context of this paper is the following utterance in which Kerry uses the term *sustainable*:

"The costs of inaction get more and more expensive the longer we wait—and the longer we wait, the less likely we are to avoid the worst and leave future generations with a sustainable planet" (l. 144-146). What makes this utterance so interesting is that it is highly ambiguous. On one hand, very typical economic and/or financial terms such as 'cost' and 'expensive' suggest that the focus lies on the business side of *sustainability*. However the second part of the utterance, speaking of leaving future generations with a sustainable planet, suggests a more ideological focus on the environment and human future. No explication of what Kerry means by 'a sustainable planet' and what kind of 'costs and expenses' are growing is offered either before or after this phrase any whatsoever. It is to a great extent up to the listener to interpret this, as Kerry could have multiple connotative understandings of the term *sustainable* (see figure 4 below). This (compared to the other examples discussed in this analysis) clearly above average audience responsibility of interpretation is, in itself, remarkable since the primary audience Kerry addresses, the senators, consists of democrats as well as republicans. It can be imagined that two political parties that have opposed each other for decades if not centuries, as parts of a two-party system, have different ideological backgrounds.

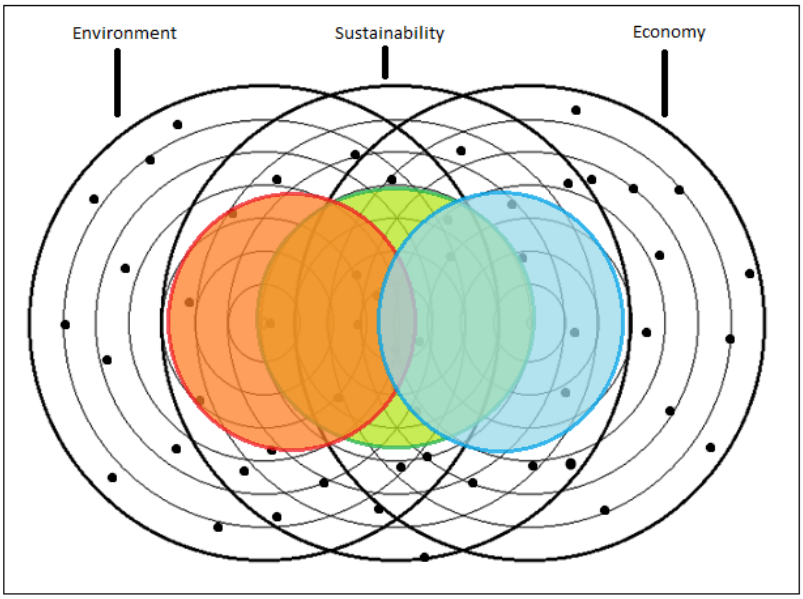

Figure 3. schematic example of possible ground for ambiguity caused by Kerry's use of the lexical item 'sustainable' in a context where no clear intended message can be deduced. As a result, it is up to the reader to interpret whether Kerry focuses mostly on the environmental sides of 'sustainability' (red circle), the economic aspects (blue circle) or has a more balanced understanding of sustainability (green circle). Of course anything in between is also possible. The problem is that as it is up to the audience to interpret which of these senses Kerry intends with regards to 'sustainability' there is the risk that the audience is for example biased towards their own interpretation of the term, influenced by the dominance of a certain explanation of the term in their environment, or prejudiced about Kerry('s prototype of sustainability) resulting in them misinterpreting the term.

Interestingly, neither from a more holistic analysis of Kerry's speech nor from a more specific focus on other instances of use of the term *sustainability* can the listener and/or reader easily deduct Kerry's envisaged message in his use of the term, at least not through a focus on surrounding congruent terms that can help in the process of selectively accessing certain aspects of the term. In some instances of use it seems as if Kerry includes both the environmental and the economic aspects of his understanding of *sustainability* in his utterance, such as in "a growing economy creates the resources necessary for environmental protection, and environmental protection makes growth sustainable over the long term" (l. 44-46). In this specific situation, it is clear that Kerry believes that 'sustainable growth' is the result of environmental measures, but that 'economic growth' is necessary to take the right measures. Sustainable growth is clearly something that can take place only if both the economic and the environmental aspects of creating *sustainability* are met.

Another case in which Kerry uses the term *sustainability* is the following: "Under that scenario the "worst" will be more jobs; the opening of a whole new $6 trillion dollar energy market with a more sustainable policy; a healthier population because of cleaner air and reduced expenditure on health care because of environmentally induced disease" (l. 93-96). The mix of hard economic figures and terms such as '$6 trillion dollar', 'more jobs', and 'energy market' on one hand and the use of more social and environmental aspects such as 'a healthier population' and 'cleaner air' surrounding the term *sustainability* complicate the understanding of the intended meaning of *sustainability* in this instance. Both environmental and economic sides of *sustainability* are mentioned, but whether a 'sustainable policy' is a policy in which avoiding any more stress on the environment than necessary is the leading purpose, whether creating maximum growth that stretches so far that the environment can just get by in the long term, or whether a more balanced position is meant with regards to what a 'sustainable policy' is cannot be logically deduced from the co-text and context in a straightforward and (near) objective manner. At best it can be said that one can be fairly certain that the placement of the term 'policy' directly after 'sustainable' suggests a certain level of interpretative guidance towards the political, policy-making aspects of *sustainability.*

It is up to the audience to fill in the blanks, which in the situation of a specifically rich and diverse balanced ambiguous term such as *sustainability* might become especially problematic. This responsibility could for example very well result in people using their own understanding of the term *sustainability* to fill in the meaning of Kerry's statement that "the costs of inaction get more and more expensive the longer we wait—and the longer we wait, the less likely we are to avoid the worst and leave future generations with a sustainable

planet" (l. 144-146). The problem, as presented in the previous paragraph, is that a 'sustainable planet', resulting from a 'sustainable policy', can be many things. Especially in a situation where politicians with very different political and socio-cultural backgrounds gather, as is the case with Kerry's speech in the US senate, this might cause some serious miscommunication. Moreover, there is much at stake as ambiguity might in this specific setting (negatively) affect policy-making as a result of the misjudgment of the intended message of proposed policies that affect millions of people. In the process of deciding upon a direction and strife, it seems only logical that it is vital that all participants in the process of decision-making have the same understanding of the intended goal and message at hand in order to create and sustain workable and uniform policies.

The question is, then, whether Kerry purposely offers his audience a term that has the potential to be ambiguous in terms of intended and/or received meaning and that is at such a vital position in his reasoning in such a vague manner. A national political body such as the US senate can be typified as a body in which speakers have multiple audiences. Not only the own party and the opposition are listening, so is the general public. This multi-layered audience that is in part directly present and in part sees or hears the speech indirectly, that can in part respond and in part plays a more active role in the discussion, creates a very special situation. It can be imagined that creating ambiguity is a strategy to say what the voter wants to hear, but in such a manner that one's opposition can interpret it to their own liking, resulting in a mitigation of face threat to the opposition's politicians. In this sense, there is the incentive to as it were put up a play, for a vast variety of reasons. This is for example also described by Henk te Velde in the context of parliamentary debate, and although the US officially does not have a parliament, the US senate shows a fair amount of resemblance in terms of make-up, role, and audience, so it can be expected that for the US senate the role of theatre will not be of much less import than it is in the cases described by te Velde, such as the British and Dutch parliament.

This situation leaves the audience with a level of uncertainty that, if it cannot be answered to any satisfactory degree in the context of an extensive textual and contextual analysis, will certainly not be easily analyzable at the spot. If this is not Kerry's intention, then surely his message is one that through its ambiguity might cause miscommunication. In such a case self-translation through elaboration and the use of congruent terms that can serve as pragmatic markers could be the easiest solution, as these might help the audience in their process of making the right semantic judgment (through *selective access)*. However, even if it is a strategy applied purposely by Kerry, it might still result in a situation of

miscommunication on the receiver's part, as the audience might prefer understanding Kerry's real opinion, but through their own interpretation of terms and concepts such as *sustainability* fill in the blanks in a skewed manner. In such a case the presence of a mediating party, which can in practice be journalists, newsreaders, discourse scientists, to name but a few, might help. It is these people that are probably best equipped to carry across the message truly uttered by the speaker, such as in this case Kerry, and also point out issues of ambiguity to the audience whenever they occur.

6. Discussion of Results

From the combination of the different speech analyses it becomes apparent that there is a very diverse way in which, and with which apparent intended message in mind, political leaders seem to use the term *sustainability* and variants of it in their addresses. In some of the discussed examples, especially in the case of Blair, the usage of *sustainability* is very diverse as it is repeatedly combined with a wide variety of congruent terms suggesting environmental, economic, and to a lesser degree social associations. In the case of Blair the intended message of the term in any given instance is very clear as he clearly and directly uses the words directly surrounding the *sustainability*-utterance to clarify what specific message he is trying to get across. In other cases, such as Kerry's speech, this diversity of connotations is also present, but there is no obvious way of deducing the meaning of Kerry's use of *sustainability* by looking at its co-text. Whether this is a strategy or an unmeant shortcoming cannot be objectively determined, but it is clear that there is a situation in which ambiguity might cause the skewing or degeneration of the actual message somewhere in the process that takes place between the speaker's utterance and the moment the audience finishes interpreting the message. This is an issue that could possibly be solved through intersemantic translation, in which either Kerry himself or an interpreting third party such as journalists or newsreaders can for example use elaboration and concrete explanations to minimize ambiguity.

In some cases the use of the term *sustainability* appears to be very uniform and narrow, such as Bush's usage of the term, which mainly suggests attention to economic and political factors. The very opposite of this can be found in Prince Charles's speeches, in which instances can be found in which from the textual context it becomes apparent that the usage of *sustainability* seems to be almost completely concerned with environmental and social aspects. The way in which Charles puts the term *sustainability* in a context that is somewhat more extreme in the direction of environmental and social aspects than the other speakers discussed might be the result of his special role, as a public figure that officially doesn't have a political role, or as a result of the audience, which appears to mainly consist of scientists and young adults, differing greatly from the main audiences of all other speeches discussed.

Noteworthy is also the very narrow use of the lexical item *sustainable* in Ban Ki-Moon's speech, as all three instances of use are about 'sustainable development'. Interestingly several others, such as Blair, also use this combination. It appears that Ban Ki-

Moon uses less overt explanations of his intended meaning concerning *sustainability* utterances than Blair does, but this does not necessarily increase ambiguity. Rather, it seems that the way Ban Ki-Moon uses the term fits nicely within the rest of the tone of his speech and suits his audience. As a result it seems that no further elaboration is necessary to make clear the true message he intends to convey.

7. Conclusion

This research has been aimed at offering an investigative and qualitative inquiry into the possible existence of individual/group-based differences in the semantic judgment of terminology in use as well as differences in terminological prototypes in cases of complex and diverse connotative (balanced) lexical ambiguity within a single lexical item, such as in this case sustainability. This has been done through the combination of an interdisciplinary research into related theoretical works and an accompanying practical case study.

Through the combination of concepts such as prototypicality and radial categorization (Lakoff, 1987) with the expectations concerning individual/group semantic judgment of meaning representation a schematic model has been presented, which can be used to further concretize and exemplify the differences between, and even within individuals/groups in the use of any given lexical item or concept.

An anticipating possible solution aimed at preventing problems in the form of the skewing and/or degeneration of actually intended messages, resulting from individual differences in the understanding of the same lexical items as a result of (balanced) lexical ambiguity has been offered. Based on ideas of deliberative and constructive communication (e.g. Habermas, Simon and Jones) a possible solution can be found in the intralingual intersemantic translation of utterances. In practice this can either be done by the speaker through the use of concretizations, elaborations, detailing, and the like, or by a third party such as journalists, newsreaders, or interpreters.

In order to test whether the theoretical concept of individual/group differences in the semantic judgment of terminology use holds in practice, the model created, and the possibility of communicative problems occurring in practice as a result of this theoretical problem an investigative case study is offered. For this investigation the term *sustainability* is selected as an especially interesting case because of its rich, abstract meaning, connotative diversity, and central position in the environmental debate, as well as its reputation for being a term that can cause (balanced lexical) ambiguity as it can mean many things to different people and in different situations (Toman; Hart).

From an analysis of a set of 21st century speeches on environmental issues by five leading political figures (Blair, Bush, Ki-Moon, Charles, Kerry) it has become apparent that there appear to be some individual differences in the way the lexical item *sustainability* and variants of it are understood and used, both between speakers as well as in some cases between different utterances of the term by the same speaker. Sometimes uniform, sometimes

diverse, the term is used in multiple connotative fields, especially in the economic, environmental, and to lesser degree social and political realms. While some speakers use the term in a very clear and logical manner, others leave open room for interpretation, in some cases up to a degree that suggests the possibility for communication risks. However, in many instances the intended message can be fairly easily deduced through the context of the speech, the co-text of the utterance (following the *selective-access hypothesis* in the specific case of balanced ambiguity), and through the background of the speaker. This last marker, one's political background, also suggests that up to a certain degree individual differences in language might be (closely) intertwined with group-based socio-cultural differences. For this, no conclusions can be drawn on the question to what level differences in the semantic judgment of the term *sustainability* are individual, and/or to what extent they can be explained as socio-cultural group differences.

Looking at the analysis, it seems that the original theory suggesting the existence of individual and/or group differences in the overall semantic judgment of terminology, such as in this case *sustainability*, holds. The model too seems to work properly in exemplifying this, and can be used to show differences between individuals/groups, differences of use within an individual/group, and the way a term (in this case *sustainability*) is linked to other lexical items. Furthermore, it seems that most speakers already use a form of intralingual intersemantic translation in order to clarify their intentions, mostly through the use of personal preferences and contextually congruent terms. However, other speakers seem to not pay (enough) attention to this issue, which suggests the possibility of individual/group differences in the semantic judgment of the speaker's envisaged message of utterances involving the term *sustainability* can in practice be a fertile soil for communicative problems such as the skewing and/or degeneration of the intended message in the process of interpretation on the audience's side, especially in instances where the audience gets no(t enough) contextual and textual input with regards to the speaker's intentions. Whether such miscommunication does in fact occur as a result of this situation remains unanswered, as the corpus (speeches) does not allow for this question to be answered, seeing as though no direct interaction can be observed from these monologues.

8. Suggestions: Further Research

It has to be pointed out that this research is investigative and qualitative in nature, serving as a stepping stone into the issues at hand. This also means this study is far from exhaustive, and multiple aspects of the theory and the corpus need further investigation.

In the field of the environmental debate an investigation into more speakers, possibly non-political or from other timespans (for example Margaret Thatcher's renowned climate change speech delivered as early as 1989 at the UN General Assembly, and the follow up speech in 1990), would offer results that would add to the solidity of this research. Quantitative investigation into the way *sustainability*, or in fact any other term, is used by different individuals could also help as it would help avoid bias through individual outliers in terms of cognitive strategies, a possibility that becomes apparent in literature on individual cognition (e.g. Lakoff, 1987, p. 9). Furthermore, qualitative research in the form of questionnaires investigating speakers' terminological prototypes might add to the understanding of the link between a speakers' use of terminology and their prototypes of the same terms.

A logical first next step in order to expand the understanding and examples of individual differences in the use and/or understanding of lexical items might be an investigation into the term *development*, as it occurs regularly and in a wide variety of contexts. An especially interesting focus would be an investigation into the lexical set *sustainable development*, as it keeps reoccurring in both the corpus and literature (e.g. Bärlund; Strange and Bailey; Ban Ki-Moon).

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APPENDIX A: Corpus Speech Transcripts.
The Transcripts of all speeches used in the analytical part of this essay can be found in the appendix. The order is as follows:

A.II.	*Tony Bair, 2004*
A.III.a.	*George W. Bush, 2008*
A.III.b.	*George W. Bush, 2007*
A.IV.	*Ban Ki-Moon, 2007*
A.V.	*Prince Charles, 2011*
A.VI.	*John Kerry, 2012*

APPENDIX A.II.: Tony Blair, 2004, '' The 10th anniversary of His Royal Highness' Business and the Environment Programme''

Transcript retrieved from http://www.climate-debate.com/tony-blair-climate-change-speech-r16.php on 02 June 2014 . Climate-debate.com. Transcriber unknown.

Tony Blair: Speech on Climate Change

The 10th anniversary of His Royal Highness' Business and the Environment Programme marks what is now recognised as the premier international forum for exploring sustainable development in the context of business.

Over the coming months we will take forward the wider sustainable development and environment agenda. Margaret Beckett is working on a comprehensive Defra 5-year programme to be released this year and a new sustainable development strategy for early next year. This will deal with, amongst other matters, issues of waste, recycling, sustainable agriculture, all aspects of biodiversity; and fishing, and will set out policies in each key area. For example, on the marine environment, I believe there are strong arguments for a new approach to managing our seas, including a new marine bill.

But tonight I want to concentrate on what I believe to be the world's greatest environmental challenge: climate change.

Our effect on the environment, and in particular on climate change, is large and growing

To summarise my argument at the outset:

From the start of the industrial revolution more than 200 years ago, developed nations have achieved ever greater prosperity and higher living standards. But through this period our activities have come to affect our atmosphere, oceans, geology, chemistry and biodiversity.

What is now plain is that the emission of greenhouse gases, associated with industrialisation and strong economic growth from a world population that has increased sixfold in 200 years, is causing global warming at a rate that began as significant, has become alarming and is simply unsustainable in the long-term. And by long-term I do not mean centuries ahead. I mean within the lifetime of my children certainly; and possibly within my own. And by unsustainable, I do not mean a phenomenon causing problems of adjustment. I mean a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence.

The problem and let me state it frankly at the outset - is that the challenge is complicated politically by two factors. First, its likely effect will not be felt to its full extent until after the time for the political decisions that need to be taken, has passed. In other words, there is a mismatch in timing between the environmental and electoral impact. Secondly, no one nation alone can resolve it. It has no definable boundaries. Short of international action commonly agreed and commonly followed through, it is hard even for a large country to make a difference on its own.

But there is no doubt that the time to act is now. It is now that timely action can avert disaster. It is now that with foresight and will such action can be taken without disturbing the essence of our way of life, by adjusting behaviour not altering it entirely.

There is one further preliminary point. Just as science and technology has given us the evidence to measure the danger of climate change, so it can help us find safety from it. The potential for innovation, for scientific discovery and hence, of course for business investment and growth, is enormous. With the right framework for action, the very act of solving it can unleash a new and benign commercial force to take the action forward, providing jobs, technology spin-offs and new business opportunities as well as protecting the world we live in.

But the issue is urgent. If there is one message I would leave with you and with the British people today it is one of urgency.

Let me turn now to the evidence itself.

The scientific evidence of global warming and climate change: UK leadership in environmental science

Apart from a diminishing handful of sceptics, there is a virtual worldwide scientific consensus on the scope of the problem. As long ago as 1988 concerned scientists set up an unprecedented Intergovernmental Panel to ensure that advice to the world's decision-makers was sound and reliable.

Literally thousands of scientists are now engaged in this work. They have scrutinised the data and developed some of the world's most powerful computer models to describe and predict our climate.

UK excellence in science is well documented: we are second only to the US in our share of the world's most cited publications.

And amongst our particular strengths are the environmental sciences, lead by the world-renowned Hadley and Tyndall centres for climate change research.

And from Arnold Schwarzenegger's California to Ningxia Province in China, the problem is being recognised.

Let me summarise the evidence:

· The 10 warmest years on record have all been since 1990. Over the last century average global temperatures have risen by 0.6 degrees Celsius: the most drastic temperature rise for over 1,000 years in the northern hemisphere.

· Extreme events are becoming more frequent. Glaciers are melting. Sea ice and snow cover is declining. Animals and plants are responding to an earlier spring. Sea levels are rising and are forecast to rise another 88cm by 2100 threatening 100m people globally who currently live below this level.

· The number of people affected by floods worldwide has already risen from 7 million in the 1960s to 150 million today.

· In Europe alone, the severe floods in 2002 and had an estimated cost of $16bn.

· This summer we have seen violent weather extremes in parts of the UK.

These environmental changes and severe weather events are already affecting the world insurance industry. Swiss Re, the world's second largest insurer, has estimated that the economic costs of global warming could double to $150bn each year in the next 10 years, hitting insurers with $30-40bn in claims.

By the middle of this century, temperatures could have risen enough to trigger irreversible melting of the Greenland ice-cap - eventually increasing sea levels by around seven metres.

There is good evidence that last year's European heat wave was influenced by global warming. It resulted in 26,000 premature deaths and cost $13.5bn.

It is calculated that such a summer is a one in about 800 year event. On the latest modelling climate change means that as soon as the 2040s at least one year in two is likely to be even warmer than 2003.

That is the evidence. There is one overriding positive: through the science we are aware of the problem and, with the necessary political and collective will, have the ability to address it effectively.

The public, in my view, do understand this. The news of severe weather abroad is an almost weekly occurrence. A recent opinion survey by Greenpeace showed that 78% of people are concerned about climate change.

But people are confused about what they can do. It is individuals as well as governments and corporations who can make a real difference. The environmental impacts from business are themselves driven by the choices we make each day.

To make serious headway towards smarter lifestyles, we need to start with clear and consistent policy and messages, championed both by government and by those outside government. Telling people what they can do that would make a difference.

UK Action

I said earlier it needed global leadership to tackle the issue. But we cannot aspire to such leadership unless we are seen to be following our own advice.

So, what is the UK government doing? We have led the world in setting a bold plan and targets for reducing greenhouse gas emissions.

We are on track to meet our Kyoto target. The latest estimates suggest that greenhouse gas emissions in 2003 were about 14% below 1990 levels. But we have to do more to achieve our commitment to reduce carbon dioxide emissions by 20% by 2010.

Our targets are ambitious and we must continually review and refine how we can meet them. In 2000, we published our Climate Change Programme, which set out a comprehensive range of policies aimed at reducing our greenhouse gas emissions. Tomorrow, we'll be setting out the details of this review to see if it is achieving the necessary progress towards our short-term and long-term emissions targets, and if not, to see how we can do better.

In the longer term, The Royal Commission on Environmental Pollution's seminal report on energy concluded that to make its contribution towards tackling climate change, the UK needed to reduce our carbon dioxide emissions by 60% by 2050. This implies a massive change in the way this country produces and uses energy. We are committed to this change.

There are immense business opportunities in sustainable growth and moving to a low carbon economy

The UK has already shown that it can have a strongly growing economy while addressing environmental issues. Between 1990 and 2002 the UK economy grew by 36%, while greenhouse gas emissions fell by around 15%.

But business itself must seize the opportunities: it is those hi-tech, entrepreneurial businesses with the foresight and capability to tap into the UK's excellent science base that will succeed. Tackling climate change will take leadership, dynamism and commitment - qualities that I know are abundantly represented in this room.

As part of next year's G8 process I want to advance work on promoting the development and uptake of cleaner energy technologies begun under the French presidency in 2003 and continued by the US this year.

We need both to invest on a large scale in existing technologies and to stimulate innovation into new low carbon technologies for deployment in the longer term. There is huge scope for improving energy efficiency and promoting the uptake of existing low carbon technologies like PV, fuel cells and carbon sequestration.

This technology is coming out of the laboratory and becoming reality in new fuel cell cars, combined heat and power generators and in new low carbon fuels. The next generation of photovoltaics are unlikely to need the now familiar panels: smart windows could generate the power required for new buildings. And carbon sequestration: literally capturing carbon and storing it in the ground, also has real potential. BP are already involved in an Algerian project which aims to store 17 million tonnes of CO2.

What we need to do is build an international consensus on how we can speed up the introduction of these technologies

And there are already many great examples of companies here in the UK showing the way:

· Ceres Power based in Crawley and utilising technology developed at Imperial College have developed a new fuel cell that has unique properties and is a world leader, and

· just a few weeks ago Ocean Power Delivery transmitted the first offshore wave energy from the seas off Orkney to the UK grid.

And these are not isolated examples.

Understandably, climate change focuses minds on big, industrial, energy users. But retailers are also working with suppliers to reduce the impacts of goods and services that they sell. I want to see the day when consumers can expect that environmental responsibility is as fundamental to the products they buy as health and safety is now.

Government has to work with business to move forward, faster. For example, we will help business cut waste and improve resource efficiency and competitiveness through a programme of new measures funded through landfill tax receipts. We will follow up the report of the Sustainable Buildings Task Group to raise environmental standards in construction.

The Carbon Trust is helping business to address their energy use and encourage low-carbon innovation. In total, efficiency measures are expected to save almost 8 million tonnes of carbon from business by 2010, more than 10% of their emissions in 2000.

Our renewables obligation has provided a major stimulus for the development of renewable energy in the UK. It has been extended to achieve a 15.4% contribution from renewables to the UK's electricity needs by 2015, on a path to our aspiration of a 20% contribution by 2020. In the short term, wind energy - in future increasingly offshore - is expected to be the primary source of smart, renewable power.

Our position on nuclear energy has not changed. And as we made clear in our energy white paper last year, the government does "not rule out the possibility that at some point in the future new nuclear build might be necessary if we are to meet our carbon targets."

In short, we need to develop the new green industrial revolution that develops the new technologies that can confront and overcome the challenge of climate change; and that above all can show us not that we can avoid changing our behaviour but we can change it in a way that is environmentally sustainable.

Just as British know-how brought the railways and mass production to the world, so British scientists, innovators and business people can lead the world in ways to grow and develop sustainably.

I am confident business will seize this opportunity. Cutting waste and saving energy could save billions of pounds each year. With about 90% of production materials never part of the final product and 80% of products discarded after single use, the opportunities are clear.

Local, practical sustainability: new schools, new housing and re-invigorating 'Agenda 21'

But government can give a lead in its own procurement policy.

New sustainable schools

There is a huge school building programme underway. All new schools and City Academies should be models for sustainable development: showing every child in the classroom and the playground how smart building and energy use can help tackle global warming.

The government is now developing a school specific method of environmental assessment that will apply to all new school buildings. Sustainable development will not just be a subject in the classroom: it will be in its bricks and mortar and the way the school uses and even generates its own power.

Our students won't just be told about sustainable development, they will see and work within it: a living, learning, place in which to explore what a sustainable lifestyle means.

Housing

The economic and social case for new housing is compelling. But we must also ensure that our approach is environmentally sustainable. This means action at both the national and local level. Heating, lighting and cooling buildings produces about half of total UK carbon emissions.

In 2002 we raised the minimum standard for the energy performance of new buildings by 25%. And next year we'll raise it by another 25%. The challenge now is to work with the building industry to encourage sustainability to be part of all new housing through a new flexible Code for Sustainable Buildings.

The new developments proposed in specific parts of the south east including the Thames Gateway represent a huge opportunity for us to show what can be achieved in terms of modern, smart, 21st century, sustainable living: not just in terms of reduced energy use, but also through better waste management, sustainable transport and availability of quality local parks and amenities.

Re-invigorating Agenda 21

Many local communities understand the links between the need to tackle national and global environmental challenges and everyday actions to improve our neighbourhoods and create better places to live.

In 1997, I encouraged all local authorities to work with their communities and produce Local Agenda 21 plans by 2000.

There was an overwhelming response: from County Durham to Wiltshire and from Redbridge to Cheshire, local people showed what could be done. Next year, as a key part of our new Sustainable Development Strategy, I want to reinvigorate community action on sustainable development.

Action in the EU

From this base, of domestic action we move out to action Europe-wide.

We believe, as I know many of you do, that trading is the most cost effective way to reduce emissions. The emissions trading scheme which we have advocated and pushed in Europe is of great importance to our goals, and to those of Europe. The establishment of a carbon trading market throughout the world's most important economic area next year will be an enormous achievement, and will change the way thousands of businesses think about their

energy use. Cutting carbon emissions is the way the future will be, and we have repeatedly said that there are advantages to British industry from early action

In Britain and throughout the world, the expected rapid growth in demand for transport, including aviation, means that we must develop far cleaner and more efficient aircraft and cars.

I am advised that by 2030, emissions from aircraft could represent a quarter of the UK's total contribution to global warning. A big step in the right direction would be to see aviation brought into the EU emissions trading scheme in the next phase of its development. During our EU Presidency we will argue strongly for this.

And the UK is taking a strong lead globally

From Europe, we need then to secure action world-wide. Here it is important to stress the scale of the implications for the developing world. It is far more than an environmental one, massive though that is. It needs little imagination to appreciate the security, stability and health problems that will arise in a world in which there is increasing pressure on water availability; where there is a major loss of arable land for many; and in which there are large-scale displacements of population due to flooding and other climate change effects.

It is the poorest countries in the world that will suffer most from severe weather events, longer and hotter droughts and rising oceans. Yet it is they who have contributed least to the problem. That is why the world's richest nations in the G8 have a responsibility to lead the way: for the strong nations to better help the weak.

Such issues can only be properly addressed through international agreements. Domestic action is important, but a problem that is global in cause and scope can only be fully addressed through international agreement. Recent history teaches us such agreements can achieve results.

The 1987 Montreal Protocol - addressing the challenge posed by the discovery of the hole in the ozone layer - has shown how quickly a global environmental problem can be reversed once targets are agreed.

However, our efforts to stabilise the climate will need, over time, to become far more ambitious than the Kyoto Protocol. Kyoto is only the first step but provides a solid foundation for the next stage of climate diplomacy. If Russia were to ratify that would bring it into effect.

We know there is disagreement with the US over this issue. In 1997 the US Senate voted 95-0 in favour of a resolution that stated it would refuse to ratify such a treaty. I doubt time has shifted the numbers very radically.

But the US remains a signatory to the UN Framework Convention on Climate Change, and the US National Academy of Sciences agree that there is a link between human activity, carbon emissions and atmospheric warming. Recently the US Energy Secretary and Commercial Secretary jointly issued a report again accepting the potential damage to the planet through global warming.

Climate change will be a top priority for our G8 Presidency next year

Recently, I announced that together with Africa, climate change would be our top priority for next year's G8. I do not under-estimate the difficulties. This remains an issue of high and fraught politics for many countries. But it is imperative we try.

I want today to highlight three key parts of my G8 strategy.

First, I want to secure an agreement as to the basic science on climate change and the threat it poses. Such an agreement would be new and provide the foundation for further action.

Second, agreement on a process to speed up the science, technology, and other measures necessary to meet the threat.

Third, while the eight G8 countries account for around 50% of global greenhouse gas emissions, it is vital that we also engage with other countries with growing energy needs - like China and India; both on how they can meet those needs sustainably and adapt to the adverse impacts we are already locked into.

Given the different positions of the G8 nations on this issue, such agreement will be a major advance; but I believe it is achievable.

The G8 presidency is a wonderful opportunity to give a big push to international opinion and understanding, among businesses as well as governments.

We have to recognise that the commitments reflected in the Kyoto protocol and current EU policy are insufficient, uncomfortable as that may be, and start urgently building a consensus based on the latest and best possible science.

Prior to the G8 meeting itself we propose first to host an international scientific meeting at the Hadley Centre for Climate Prediction and Research in Exeter in February. More than just another scientific conference, this gathering will address the big questions on which we need to pool the answers available from the science:

· "What level of greenhouse gases in the atmosphere is self-evidently too much?" and · "What options do we have to avoid such levels?"

This can help inform discussion at the G8.

Conclusion

The situation therefore can be summarised in this way:

1 If what the science tells us about climate change is correct, then unabated it will result in catastrophic consequences for our world.

2 The science, almost certainly, is correct.

3 Recent experience teaches us that it is possible to combine reducing emissions with economic growth.

4 Further investment in science and technology and in the businesses associated with it has the potential to transform the possibilities of such a healthy combination of sustainability and development.

5 To acquire global leadership, on this issue Britain must demonstrate it first at home.

6 The G8 next year, and the EU presidency provide a great opportunity to push this debate to a new and better level that, after the discord over Kyoto, offers the prospect of agreement and action.

None of this is easy to do. But its logic is hard to fault. Even if there are those who still doubt the science in its entirety, surely the balance of risk for action or inaction has changed. If there were even a 50% chance that the scientific evidence I receive is right, the bias in favour of action would be clear. But of course it is far more than 50%.

And in this case, the science is backed up by intuition. It is not axiomatic that pollution causes damage. But it is likely. I am a strong supporter of proceeding through scientific analysis in such issues. But I also, as I think most people do, have a healthy instinct that if we upset the balance of nature, we are in all probability going to suffer a reaction. With world growth, and population as it is, this reaction must increase.

We have been warned. On most issues we ask children to listen to their parents. On climate change, it is parents who should listen to their children.

Now is the time to start.

APPENDIX A.III.a.: George W. Bush, 2008, '' President Bush Discusses Climate Change''

Transcript retrieved from http://georgewbush-whitehouse.archives.gov/news/releases/2008/04/20080416-6.html on 03 Jun 2014. The White House. Transcriber unknown.

George W. Bush: Speech on Climate Change

THE PRESIDENT: Thank you. Welcome. Thank you all for coming. I particularly want to thank members of my Cabinet for joining me here today in the Rose Garden.

Tomorrow represents -- representatives of the world's major economies will gather in Paris to discuss climate change. Here in Washington, the debate about climate change is intensifying. Today, I'll share some views on this important issue to advance discussions both at home and abroad.

President George W. Bush speaks on climate change during remarks from the Rose Garden Wednesday, April 16, 2008, at the White House. Said the President, "I'm confident that with sensible and balanced policies from Washington, American innovators and entrepreneurs will pioneer a new generation of technology that improves our environment, strengthens our economy, and continues to amaze the world." White House photo by Noah Rabinowitz Climate change involves complicated science and generates vigorous debate. Many are concerned about the effect of climate change on our environment. Many are concerned about the effect of climate change policies on our economy. I share these concerns, and I believe they can be sensibly reconciled.

Over the past seven years, my administration has taken a rational, balanced approach to these serious challenges. We believe we need to protect our environment. We believe we need to strengthen our energy security. We believe we need to grow our economy. And we believe the only way to achieve these goals is through continued advances in technology. So we've pursued a series of policies aimed at encouraging the rise of innovative as well as more cost-effective clean energy technologies that can help America and developing nations reduce greenhouse gases, reduce our dependence on oil, and keep our economies vibrant and strong for decades to come.

I have put our nation on a path to slow, stop, and eventually reverse the growth of our greenhouse gas emissions. In 2002, I announced our first step: to reduce America's greenhouse gas intensity by 18 percent through 2012. I'm pleased to say that we remain on track to meet this goal even as our economy has grown 17 percent.

As we take these steps here at home, we're also working internationally on a rational path to addressing global climate change. When I took office seven years ago, we faced a problem. A number of nations around the world were preparing to implement the flawed approach of Kyoto Protocol. In 1997, the United States Senate took a look at the Kyoto approach and passed a resolution opposing this approach by a 95 to nothing vote.

The Kyoto Protocol would have required the United States to drastically reduce greenhouse gas emissions. The impact of this agreement, however, would have been to limit our economic growth and to shift American jobs to other countries -- while allowing major

developing nations to increase their emissions. Countries like China and India are experiencing rapid economic growth -- and that's good for their people and it's good for the world. This also means that they are emitting increasingly large quantities of greenhouse gases -- which has consequences for the entire global climate.

So the United States has launched -- and the G8 has embraced -- a new process that brings together the countries responsible for most of the world's emissions. We're working toward a climate agreement that includes the meaningful participation of every major economy -- and gives none a free ride.

In support of this process, and based on technology advances and strong new policy, it is now time for the U.S. to look beyond 2012 and to take the next step. We've shown that we can slow emissions growth. Today, I'm announcing a new national goal: to stop the growth of U.S. greenhouse gas emissions by 2025.

To reach this goal, we will pursue an economy-wide strategy that builds on the solid foundation that we have in place. As part of this strategy, we worked with Congress to pass energy legislation that specifies a new fuel economy standard of 35 miles per gallon by 2020, and requires fuel producers to supply at least 36 billion gallons of renewable fuel by 2022. This should provide an incentive for shifting to a new generation of fuels like cellulosic ethanol that will reduce concerns about food prices and the environment.

We also mandated new objectives for the coming decade to increase the efficiency of lighting and appliances. We're helping states achieve their goals for increasing renewable power and building code efficiency by sharing new technologies and providing tax incentives. We're working to implement a new international agreement that will accelerate cuts in potent HCFC emissions. Taken together, these landmark actions will prevent billions of metric tons of greenhouse gas emissions from entering the atmosphere.

These objectives are backed by a combination of new market-based regulations, new government incentives, and new funding for technology research. We've provided billions of dollars for next generation nuclear energy technologies. Along with the private sector, we've invested billions more to research, develop and commercially deploy renewable fuels, hydrogen fuel cells, advanced batteries, and other technologies to enable a new generation of vehicles and more reliable renewable power systems.

In 2009 alone, the government and the private sector plan to dedicate nearly a billion dollars to clean coal research and development. Our incentives for power production from wind and solar energy have helped to more than quadruple its use. We have worked with Congress to make available more than $40 billion in loan guarantees to support investments that will avoid, reduce, or sequester greenhouse gas emissions or air pollutants. And our farmers can now compete for substantial new conservation incentives to restore land and forests in ways that help cut greenhouse gases.

We're doing a lot to protect this environment. We've laid a solid foundation for further progress. But these measures -- while these measures will bring us a long way to achieving our new goal, we've got to do more in the power generation sector. To reach our 2025 goal, we'll need to more rapidly slow the growth of power sector greenhouse gas emissions so they peak within 10 to 15 years, and decline thereafter. By doing so, we'll reduce emission levels

in the power sector well below where they were projected to be when we first announced our climate strategy in 2002.

There are a number of ways to achieve these reductions, but all responsible approaches depend on accelerating the development and deployment of new technologies.

As we approach this challenge, we face a growing problem here at home. Some courts are taking laws written more than 30 years ago -- to primarily address local and regional environmental effects -- and applying them to global climate change. The Clean Air Act, the Endangered Species Act, and the National Environmental Policy Act were never meant to regulate global climate. For example, under a Supreme Court decision last year, the Clean Air Act could be applied to regulate greenhouse gas emissions from vehicles. This would automatically trigger regulation under the Clean Air Act of greenhouse gases all across our economy -- leading to what Energy and Commerce Committee Chairman John Dingell last week called, "a glorious mess."

If these laws are stretched beyond their original intent, they could override the programs Congress just adopted, and force the government to regulate more than just power plant emissions. They could also force the government to regulate smaller users and producers of energy -- from schools and stores to hospitals and apartment buildings. This would make the federal government act like a local planning and zoning board, have crippling effects on our entire economy.

Decisions with such far-reaching impact should not be left to unelected regulators and judges. Such decisions should be opened -- debated openly; such decisions should be made by the elected representatives of the people they affect. The American people deserve an honest assessment of the costs, benefits and feasibility of any proposed solution.

This is the approach Congress properly took last year on mandatory policies that will reduce emissions from cars and trucks, and improve the efficiency of lighting and appliances. This year, Congress will soon be considering additional legislation that will affect global climate change. I believe that Congressional debate should be guided by certain core principles and a clear appreciation that there is a wrong way and a right way to approach reducing greenhouse gas emissions. Bad legislation would impose tremendous costs on our economy and on American families without accomplishing the important climate change goals we share.

The wrong way is to raise taxes, duplicate mandates, or demand sudden and drastic emissions cuts that have no chance of being realized and every chance of hurting our economy. The right way is to set realistic goals for reducing emissions consistent with advances in technology, while increasing our energy security and ensuring our economy can continue to prosper and grow.

The wrong way is to sharply increase gasoline prices, home heating bills for American families and the cost of energy for American businesses.

The right way is to adopt policies that spur investment in the new technologies needed to reduce greenhouse gas emissions more cost-effectively in the longer term without placing unreasonable burdens on American consumers and workers in the short term.

The wrong way is to jeopardize our energy and economic security by abandoning nuclear power and our nation's huge reserves of coal. The right way is to promote more emission-free nuclear power and encourage the investments necessary to produce electricity from coal without releasing carbon into the air.

The wrong way is to unilaterally impose regulatory costs that put American businesses at a disadvantage with their competitors abroad -- which would simply drive American jobs overseas and increase emissions there. The right way is to ensure that all major economies are bound to take action and to work cooperatively with our partners for a fair and effective international climate agreement.

The wrong way is to threaten punitive tariffs and protectionist barriers, start a carbon-based global trade war, and to stifle the diffusion of new technologies. The right way is to work to make advanced technology affordable and available in the developing world -- by lowering trade barriers, creating a global free market for clean energy technologies, and enhancing international cooperation and technology investment.

We must all recognize that in the long run, new technologies are the key to addressing climate change. But in the short run, they can be more expensive. And that is why I believe part of any solution means reforming today's complicated mix of incentives to make the commercialization and use of new, lower emission technologies more competitive. Today we have different incentives for different technologies -- from nuclear power, to clean coal, to wind and solar energy. What we need to do is consolidate them into a single, expanded program with the following features.

First, the incentive should be carbon-weighted to make lower emission power sources less expensive relative to higher emissions sources -- and it should take into account our nation's energy security needs.

Second, the incentive should be technology-neutral because the government should not be picking winners and losers in this emerging market.

Third, the incentive should be long-lasting. It should provide a positive and reliable market signal not only for the investment in a technology, but also for the investments in domestic manufacturing capacity and infrastructure that will help lower costs and scale up availability.

Even with strong new incentives, many new technologies face regulatory and political barriers. To pave the way for a new generation of nuclear power plants, we must provide greater certainty on issues from licensing to responsible management of spent fuel. The promise of carbon capture and storage depends on new pipelines and liability rules. Large-scale renewable energy installations are most likely to be built in sparsely populated areas -- which will require advanced, interstate transmission systems to deliver this power to major population centers. If we're serious about confronting climate change, then we have to be serious about addressing these obstacles.

If we fully implement our new strong laws, adhere to the principles that I've outlined, and adopt appropriate incentives, we will put America on an ambitious new track for greenhouse gas reductions. The growth in emissions will slow over the next decade, stop by 2025, and begin to reverse thereafter, so long as technology continues to advance.

Our new 2025 goal marks a major step forward in America's efforts to address climate change. Yet even if we reduced our own emissions to zero tomorrow, we would not make a meaningful dent in solving the problem without concerted action by all major economies. So in connection with the major economies process we launched, we're urging each country to develop its own national goals and plans to reduce greenhouse gas emissions.

Like many other countries, America's national plan will be a comprehensive blend of market incentives and regulations to reduce emissions by encouraging clean and efficient energy technologies. We're willing to include this plan in a binding international agreement, so long as our fellow major economies are prepared to include their plans in such an agreement. We recognize that different nations will design different strategies, with goals and policies that reflect their unique energy resources and economic circumstances. But we can only make progress if their plans will make a real difference as well.

The next step in the major economies process is a meeting this week in Paris -- and I want to thank my friend, President Sarkozy, for hosting it. There, representatives of all participating nations will lay the groundwork for a leaders' meeting in conjunction with the G8 summit in July. Our objective is to come together on a common approach that will contribute to the negotiations under the U.N. Framework Convention of global climate once the Kyoto Protocol expires in 2012. This approach must be environmentally effective and economically sustainable.

To be effective, this approach will -- this approach will require commitments by all major economies to slow, stop, and eventually reverse the growth of greenhouse gas emissions. To be economically sustainable, this approach must foster the economic growth necessary to pay for investments in new technology and to raise living standards. We must help countries in the developing world gain access to the technologies, as well as financing that will enable them to take a lower carbon path to economic growth.

And then there will be the major economies leader meeting in July -- that's the one I'll be going to -- where we will seek agreement on a long-term global goal for emissions reductions, as well as an agreement on how national plans will be part of the post-2012 approach. We'll also seek to increase international cooperation among private firms and governments in key sectors such as power generation, auto manufacturing, renewable fuels, and aluminum and steel.

We will work toward the creation of an international clean technology fund that will help finance low-emissions energy projects in the developing world. We'll call on all nations to help spark a global clean energy revolution by agreeing immediately to eliminate trade barriers on clean energy goods and services.

The strategy I have laid out today shows faith in the ingenuity and enterprise of the American people -- and that's a resource that will never run out. I'm confident that with sensible and balanced policies from Washington, American innovators and entrepreneurs will pioneer a new generation of technology that improves our environment, strengthens our economy, and continues to amaze the world.

Thanks for coming. (Applause.)

APPENDIX A.III.b.: George W. Bush, 2007, ‘’ President Bush Participates in Major Economies Meeting on Energy Security and Climate Change’’

Transcript retrieved from http://2001-2009.state.gov/g/oes/rls/rm/2007/92938.htm on 03 Jun. 2014. US Department of State. Transcriber unknown.

George W. Bush: Speech on Energy Security and Climate Change

THE PRESIDENT: Good morning. Thank you. Welcome to the State Department. I'm honored to address this historic meeting on energy security and climate change. And I appreciate you all being here.

Energy security and climate change are two of the great challenges of our time. The United States takes these challenges seriously. The world's response will help shape the future of the global economy and the condition of our environment for future generations. The nations in this room have special responsibilities. We represent the world's major economies, we are major users of energy, and we have the resources and knowledge base to develop clean energy technologies.

Our guiding principle is clear: We must lead the world to produce fewer greenhouse gas emissions, and we must do it in a way that does not undermine economic growth or prevent nations from delivering greater prosperity for their people. We know this can be done. Last year America grew our economy while also reducing greenhouse gases. Several other nations have made similar strides.

This progress points us in the right direction, but we've got to do more. So before this year's G8 summit, I announced that the United States will work with other nations to establish a new international approach to energy security and climate change. Today's meeting is an important step in this process. With the work we begin today, we can agree on a new approach that will reduce greenhouse gas emissions, strengthen energy security, encourage economic growth and sustainable development, and advance negotiations under the United Nations Framework Convention on Climate Change. (Applause.)

I thank the State Department for hosting this event. I appreciate members of my Cabinet who have joined us today. I thank Jim Connaughton, who is the Chairman of the Council on Environmental Quality, for being here. I appreciate you being the personal representative of this, and I hope you're doing -- I hope you think he's doing a fine job. (Applause.)

I welcome Minister Rachmat, the Minister of Environment of Indonesia, who is the Chairman of the upcoming U.N. climate meeting in December. I welcome Mr. de Boer, who is the Executive Secretary of the United Nations Framework Convention on Climate Change. I welcome all the ministers and delegates who are here. We really appreciate you coming. I thank the ambassadors for joining this august group. I thank members of the Congress who have taken time to come by: Congressman Ed Markey of Massachusetts and Congressman Bart Gordon of Tennessee. I appreciate you taking time to come by and participate in these meetings.

Every day energy brings countless benefits to our people. Energy powers new hospitals and schools so we can live longer and more productive lives. Energy transforms the way we produce food, so we can feed our growing populations. Energy enables us to travel and

communicate across great distances, so we can expand trade and prosperity. Energy sustains the world's most advanced economies, which makes it possible for us to devote resources to fighting hunger and disease and poverty around the globe.

In this new century, the need for energy will only grow. Much of this increased demand will come from the developing world, where nations will need more energy to build critical infrastructure and grow their economies, improve the lives of their people. Overall, the demand for energy is expected to rise by more than 50 percent by 2030.

This growing demand for energy is a sign of a vibrant, global economy. Yet it also possesses -- poses serious challenges, and one of them, of course, is energy security. Right now much of the world's energy comes from oil, and much of the oil comes from unstable regions and rogue states. This dependence leaves the global economy vulnerable to supply shocks and shortages and manipulation, and to extremists and terrorists who could cause great disruptions of oil shipments.

Another challenge is climate change. Our understanding of climate change has come a long way. A report issued earlier this year by the U.N. Intergovernmental Panel on Climate Change concluded both that global temperatures are rising and that this is caused largely by human activities. When we burn fossil fuels we release greenhouse gases into the atmosphere, and the concentration of greenhouse gases has increased substantially.

For many years those who worried about climate change and those who worried about energy security were on opposite ends of the debate. It was said that we faced a choice between protecting the environment and producing enough energy. Today we know better. These challenges share a common solution: technology. By developing new low-emission technologies, we can meet the growing demand for energy and at the same time reduce air pollution and greenhouse gas emissions. As a result, our nations have an opportunity to leave the debates of the past behind, and reach a consensus on the way forward. And that's our purpose today.

No one country has all the answers, including mine. The best way to tackle this problem is to think creatively and to learn from other's experiences and to come together on a way to achieve the objectives we share. Together, our nations will pave the way for a new international approach on greenhouse gas emissions.

This new approach must involve all the world's largest producers of greenhouse gas emissions, including developed and developing nations. We will set a long-term goal for reducing global greenhouse gas emissions. By setting this goal, we acknowledge there is a problem. And by setting this goal, we commit ourselves to doing something about it.

By next summer, we will convene a meeting of heads of state to finalize the goal and other elements of this approach, including a strong and transparent system for measuring our progress toward meeting the goal we set. This will require concerted effort by all our nations. Only by doing the necessary work this year will it be possible to reach a global consensus at the U.N. in 2009.

Each nation will design its own separate strategies for making progress toward achieving this long-term goal. These strategies will reflect each country's different energy resources, different stages of development, and different economic needs.

There are many policy tools that nations can use, including a variety of market mechanisms, to create incentives for companies and consumers to invest in new low-emission energy sources. We will also form working groups with leaders of different sectors of our economies, which will discuss ways of sharing technology and best practices.

Each nation must decide for itself the right mix of tools and technologies to achieve results that are measurable and environmentally effective. While our strategies may be differentiated, we share a common responsibility to reduce greenhouse gas emissions while keeping our economies growing.

The key to this effort will be the advance of clean energy technologies. Since I became President, the United States government has invested nearly $18 billion to research, develop and promote clean and efficient energy technologies. The private sector here in our country has responded with significant investments, ranging from corporate research and development to venture capital. Our investments in research and technology are bringing the world closer to a remarkable breakthrough -- an age of clean energy where we can power our growing economies and improve the lives of our people and be responsible stewards of the earth the Almighty trusted to our care.

The age of clean energy requires transforming the way we produce electricity. Electric power plants that burn coal are the world's leading cause of greenhouse gas emissions. The world's supply of coal is secure and abundant. And our challenge is take advantage of it while maintaining our commitment to the environment. One promising solution is advanced clean coal technology. The future of this technology will allow us to trap and store carbon emissions and air pollutants produced by burning coal. Since 2001 the United States has invested more than $2.5 billion to research and develop clean coal. And in partnership with other nations and the private sector we're moving closer to a historic achievement -- producing energy from the world's first zero-emissions coal-fired plant.

We also need to take advantage of clean safe nuclear power. Nuclear power is the one existing source of energy that can generate massive amounts of electricity without causing any air pollution or greenhouse gas emissions. Without the world's 439 nuclear power plants, there would be nearly 2 billion additional tons of carbon dioxide in the atmosphere each year. And by expanding the use of nuclear power, we can reduce greenhouse gas emissions even more.

The United States is working to reduce barriers to new nuclear power plants in our country without compromising safety. Just last week, a company applied for approval to build the first new nuclear reactor in my country since the since the 1970s. As we build new reactors here in the United States, we're also working to bring the benefits of nuclear energy to other countries.

My administration established a new initiative called the Global Nuclear Energy Partnership. This partnership will work with nations with advanced civilian nuclear energy programs, such as France and Japan and China and Russia. Together we will help developing nations obtain secure, cost-effective and proliferation-resistant nuclear power, so they can have a reliable source of zero-emissions energy.

We'll also need to expand our use of two other promising sources of zero-emissions energy, and that's wind and solar power. Wind power is becoming cost-effective in many parts of America. We've increased wind energy production by more than 300 percent. We also launched the Solar America Initiative to lower the cost of solar power, so we can make -- help make this technology competitive, as well. Taken together, low-carbon technologies like wind and solar power have the potential to one day provide up to 20 percent of America's electricity.

The age of clean energy also requires transforming the way we fuel our cars and trucks. Almost all our vehicles run on gasoline or diesel fuel. This means we produce greenhouse gas emissions whenever we get behind the wheel. Transportation accounts for about 20 percent of the world's greenhouse gas emissions every year. To reduce these emissions we must reduce our dependence on oil. So America is investing in new, clean alternatives. We're investing millions of dollars to develop the next generation of sustainable biofuels like cellulosic ethanol, which means we'll use everything from wood chips to grasses to agricultural waste to make ethanol.

We're offering tax credits to encourage Americans to drive fuel-efficient hybrid vehicles. We're working to develop next-generation plug-in hybrids that will be able to travel nearly 40 miles without using a drop of gasoline. And your automobile doesn't have to look like a golf cart. (Laughter.)

We're on track to meet our pledge of investing $1.2 billion to develop advanced hydrogen-powered vehicles that emit pure water instead of exhaust fumes. We're also taking steps to make sure these technologies reach the market. We've asked Congress to set a new mandatory -- I repeat, mandatory -- fuel standard that requires 35 billion gallons of renewable and other alternative fuels in 2017, and to reform fuel economy standards for cars the same way we did for light trucks. Together these two steps will help us cut America's consumption of gasoline by 20 percent in 10 years. It's an initiative I've called 20-in-10.

Ushering in the age of clean energy is an historic undertaking. We take it seriously here in the United States. Achieving this vision will require major investment in innovation by all our nations. Today the United States and Japan fund most of the research and development for clean energy technologies. Meeting the objectives we share and the goal we're going to set will require all the nations in this hall to increase their clean energy research and development investments.

We must also work to make these technologies more widely available, especially in the developing world. So today I propose that we join together to create a new international clean technology fund. This fund will be supported by contributions from governments from around the world, and it will help finance clean energy projects in the developing world. I've asked Treasury Secretary Hank Paulson to coordinate this effort, and he plans to begin exploratory discussions with your countries over the next several months.

At the same time, we also must promote global free trade in energy technology. The most immediate and effective action we can take is to eliminate tariff and non-tariff barriers on clean energy goods and services.

As we work to transform the way we produce energy, we must also address another major factor in climate change, which is deforestation. The world's forests help reduce the amount

of greenhouse gases in the atmosphere by storing carbon dioxide. But when our forests disappear, the concentration of greenhouse gas levels rise in the atmosphere. Scientists estimate that nearly 20 percent of the world's greenhouse gas admissions [sic] are attributable to deforestation.

We're partnering with other nations to promote forest conservation and management across the world. We welcome new commitments from Australia, Brazil, with China and Indonesia. The United States remains committed to initiatives such as the Congo Basin Forest Partnership and the Asian Forest Partnership. We will continue our efforts through the Tropical Forest Conservation Act, which helps developing nations redirect debt payments toward forest conservation programs. So far my administration has concluded 12 agreements, concluding [sic] up to 50 million acres of forest lands.

America's efforts also include an $87-million initiative to help developing nations stop illegal logging. These efforts will help developing nations save their forests, and combat a major source of greenhouse gas emissions.

The United States is also taking steps to protect forests in our own country. It's one thing to help others; we got to make sure we do a good job here at home -- and we are. Since 2001, we've provided more than $3 billion to restore our forests and protect them against catastrophic fires as part of a Healthy Forest Initiative. In partnership with our farmers and ranchers, we're providing tens of billions of dollars in incentives for conservation. We're promoting sustainable public and private land-management policies. By taking these steps, we've helped increase the amount of carbon storage in our forests, and we've helped safeguard a national treasure for generations to come.

What I'm telling you is, is that we've got a strategy; we've got a comprehensive approach. And we look forward to working with our Congress to make sure that comprehensive approach is effective. And we look forward to working with you as a part of this global effort to do our duty.

And we've done this kind of work before. And we have confidence in the success of our efforts. Twenty years ago nations finalized an agreement called the Montreal Protocol to phase-out substances that were depleting the ozone layer. Since then, we have made great strides to repair the damage. Just last week, developed and developing nations reached consensus on speeding up the recovery of the ozone layer by accelerating the phase-out of these harmful substances. This accelerated phase out will bring larger benefits because they'll dramatically reduce greenhouse gas emissions.

We have seen what happens when we come together to work for a common cause, and we can do it again. And that's what I'm here to urge you. The United States will do our part. We take this issue seriously. And we look forward to bringing a spirit of cooperation and commitment to our efforts to confront the challenges of energy security and climate change. By working together, we will set wise and effective policies. That's what I'm interested in, effective policies. I want to get the job done. We've identified a problem, let's go solve it together.

We will harness the power of technology. There is a way forward that will enable us to grow our economies and protect the environment, and that's called technology. We'll meet our energy needs. We'll be good stewards of this environment. Achieving these goals will require

a sustained effort over many decades. This problem isn't going to be solved overnight. Yet years from now our children are going to look back at the choices we make today, at this deciding moment: It will be a moment when we choose to expand prosperity instead of accepting stagnation; it will be a moment when we turn the tide against greenhouse gas emissions instead of allowing the problem to grow; it will be a moment when we rejected the predictions of despair and set a course of a more hopeful future.

The moment is now, and I appreciate you attending this meeting. And we look forward to working with you. May God bless you all. (Applause.)

APPENDIX A.IV.: Ban Ki-Moon, 2007, ‘’Address to the UN Climate Change Conference’’

Transcript retrieved from http://www.climate-debate.com/ban-ki-moon-address-to-the-un-climate-change-conference-r7.php on 03 June 2014. Climate-debate.com Transcriber unknown.

Ban Ki-Moon: Speech on Climate Change

As we convene here in Bali the eyes of the world are upon us. This is a historic moment, long in the making. Decades of careful study by the planet's leading scientists. Years of heated argument among the world's policy makers. Countless media stories debating the linkage between observed natural disasters and global warming.

Now, finally, we are gathered together in Bali to address the defining challenge of our age. We gather because the time for equivocation is over. The science is clear. Climate change is happening. The impact is real. The time to act is now.

The latest report of the Intergovernmental Panel on Climate Change tells us that, unless we act, there will be serious consequences: rising sea levels; more frequent and less predictable floods and severe droughts; famine around the world, particularly in Africa and Central Asia; and the loss of up to a third of our plant and animal species.

They emphasise that the costs of inaction - in ecological, human and financial terms - far exceed the costs of action now.

But the scientists also stress a silver lining: that we can still address the problem, in ways that are both affordable and promote prosperity. By being creative, we can reduce greenhouse gas emissions while promoting economic growth.

In this sense, climate change is as much an opportunity as it is a threat. It is our chance to usher in a new age of green economics and truly sustainable development. New economies can and must grow with reduced carbon intensity even as they create new jobs and alleviate poverty.

This shift toward a greener future is in its infancy and needs urgent nurturing. The multilateral agreement that will emerge from the (United Nations) negotiations needs to make the necessary changes possible. We must ensure an incentive structure for countries, businesses, and individuals. There is no trade-off between fighting climate change and pursuing development. In the long run, we can prosper only by doing both.

Already, there is an emerging consensus on the building blocks of a climate agreement, including adaptation, mitigation, technology and financing. It must also be comprehensive and involve all nations, developed and developing. Our atmosphere can't tell the difference between emissions from an Asian factory, the exhaust from a North American SUV, or deforestation in South America or Africa. And it must be fair, reflecting the principle of common but differentiated responsibilities.

The issue of equity is crucial. Climate change affects us all, but it does not affect us all equally. Those who are least able to cope are being hit hardest. Those who have done the least to cause the problem bear the gravest consequences.

We have an ethical obligation to right this injustice. We have a duty to protect the most vulnerable.

That is why any agreement should look to developed countries to continue taking the lead on curbing emissions. And developing nations need to be given incentives to limit the growth of their emissions. Together, we can spur a new era of green economics, an era of truly sustainable development based on clean technology and a low-emission economy.

But we must also take action on the immediate challenges.

It is critical that we follow through on existing commitments and ensure the resilience of populations that are or will be the hardest hit by climate change impacts.

Distinguished Delegates, What the world expects from Bali - from all of you - is an agreement to launch negotiations towards a comprehensive climate change agreement. You need to set an agenda - a roadmap to a more secure climate future, coupled with a tight time-line that produces a deal by 2009. The date is crucial not only to ensure continuity after 2012, when the first commitment period of the Kyoto protocol expires - but equally, to address the desperate urgency of the situation itself.

I am encouraged by progress in the negotiation on both the Convention and the Kyoto protocol. The implementation and enhancement of agreements on adaptation, deforestation, and technology will be important both now and in the period after 2012.

I also note with satisfaction the movements within Annex I countries (the group of developed nations) toward the enactment of serious climate mitigation measures. I recognise the actions in non-Annex I countries through new national climate plans, policies and measures for sustainable development. I welcome these actions and urge that, as indicated in statements made during these negotiations, they pursue their expressed intentions to do still more.

Reaching a comprehensive climate agreement will not be easy.

Having the right tools for such an agreement will help us to implement it in a cost-effective way. And the United Nations will assist you in every way possible. We stand ready to deliver on the mandates that you have already entrusted us, to support you throughout the negotiating period, and to help implement the agreements reached.

Every UN agency, fund and programme is committed. We are determined to be a part of the answer to climate change. Indeed, as the summary paper distributed to all delegations explains, the chief executives of the UN system have already begun to define a joint UN contribution on this issue.

As this work progresses, we will continue to provide a credible, coherent scientific foundation for understanding what is happening to our planet and how we might best address it. We will continue to expand support for global, regional and national action on climate change, drawing on the agenda you set. And we will lead by example, by moving towards carbon neutrality throughout the UN System.

Excellencies, you have come here with a clear charge. At the high-level event on climate change in New York in September, world leaders called for a breakthrough in Bali. This is your chance to live up to what the leaders have been calling for. If we leave Bali without such a breakthrough, we will not only have failed our leaders, but also those who look to us to find solutions, namely, the peoples of this world.

This is the moral challenge of our generation. Not only are the eyes of the world upon us. More important, succeeding generations depend on us. We cannot rob our children of their future.

We are all part of the problem of global warming. Let us all be part of the solution that begins in Bali. Let us turn the climate crisis into a climate compact."

APPENDIX A.V.: His Royal Highness Prince Charles, 2011, ‘‘A speech by HRH The Prince of Wales on climate change and the environment at Cape Town University’’

Transcript retrieved from http://www.princeofwales.gov.uk/media/speeches/speech-hrh-the-prince-of-wales-climate-change-and-the-environment-cape-town on 03 June 2014. Prince of Wales. Transcriber unknown.

Prince Charles: Tackling Climate Change and International Sustainability

Chancellor, Ministers, Distinguished guests,

It is a great pleasure to be with you today, in this extraordinarily beautiful country which, in so many ways over the last two decades, has provided a beacon of hope for many people across Africa and beyond.

With the Durban Climate Conference, COP17, only a few weeks away, you have been kind – or rash! - enough to ask me to share with you some of my thoughts on the challenges that lie before us in tackling climate change and international sustainability. My wife and I are seeing how a diverse range of rural and urban communities are facing up to these challenges during our current visits to South Africa and then to Tanzania next week. Cape Town, though, could hardly be a more appropriate location to explore these themes. It is a city surrounded by one of the most biologically diverse places on Earth; it lies adjacent to highly productive ocean fisheries; and it sits at the Southern tip of a continent which is not only already having to cope with the impact of climate change, it is also wrestling with the consequences of an intensified demand for land. In differing degrees, these difficult issues are replicated right across the world. As we are seeing, there is a growing mismatch between what we demand of the Earth's resources and the ability of Nature's systems to respond. I need hardly say that we will all be defined by how we respond.

Ladies and gentlemen, in Southern Africa you are only too aware of the tensions that come from competing demands on the land. Land is the most fragile and precious of all our commodities and, as I have tried to indicate over the years, there is mounting evidence that, worldwide, we cannot carry on as we have been without suffering some very painful consequences. What with the ever-growing need for more urban development and the pressure to produce more food, it is fast becoming difficult to maintain those essential services, such as the supply of clean water and, ultimately, to protect those areas that are rich in the diversity of life and which, whether we like it or not, are actually vital if Nature is to continue sustaining herself and, therefore, us.

Add into the mix the impact of climate change and suddenly all the risks to stability are multiplied. Just consider, for instance, the way fluctuating food supplies and the spiralling demand for substances like biofuels lead to extraordinary volatility in food prices. Consider, too, the many problems that come from increased migration. This unholy combination can pose significant threats to national security, though the issues are rarely if ever seen through that prism.

I, for one, have been incredibly heartened by Cape Town University’s decision to appoint a pro-Vice Chancellor for Climate Change – an idea which I can only hope will catch on elsewhere! One of the issues which will no doubt be taxing the pro-Vice Chancellor and the wider Faculty will be ways in which to mitigate many of these inter-related problems.

Surely one starting point would be to convene representatives from various key sectors to explore the development of an economic system which is more able to withstand the sorts of shocks that will, I am afraid, only become more frequent and more severe in the years ahead. To do so, we have to create a framework that is sensitive to the relationship which exists between food security, water security, energy security – and, indeed, national security – and to the issues of how human wellbeing can be achieved without further loss to the planet's ecological integrity. This is absolutely essential if we are to lift out of poverty the three billion people around the world who live on less than two dollars a day.

Many of these people live in rural areas or have recently been displaced to urban centres; it is a sad irony that it is often farming families who themselves increasingly go hungry. We have to resolve this growing problem. It requires investment, both public and private, in agriculture and in rural economies. And, as well as financial investment, the situation needs solid public policies that support farmers as well as farming.

The scale of what is needed is, I am afraid, astonishing. The International Fund for Agricultural Development, for instance, estimates that there is a global short-fall in investment in the developing world's agriculture of at least fourteen billion U.S. dollars a year.

I have spent many years considering these problems and, indeed, their solutions and I am convinced that much could be done quickly, easily and cheaply if we set our minds to it. If nothing else, surely it cannot be beyond the wit of Man to work out how to reduce the fifty per cent of food that is currently wasted post-harvest before it reaches market, or how to allow farmers access to easily available seeds that could double or triple yields, all without the need for new varieties of seeds.

Alongside governments, if I may say so, the private sector also has a vital role to play, including those in the retail sector. They are very important agents for change. I have been struck, for example, by the wonderful work done by Pick and Pay here in South Africa to link small farmers to retailers and consumers. I am sure that much more can be done in a similar way to build that relationship between consumers and farmers. In fact, I wonder if global organizations like the Consumer Goods Forum could help here by championing new ways to support more resilient farming through their supply chains?

I need hardly say that change must also come in our approach to how we utilize the global marine environment. As you will know better than me, many fisheries are over-exploited and some are close to collapse. Yet 560 million people depend on fisheries for their livelihoods. South Africa has made important progress in recent years, especially in relation to the management of hake. Earlier today I was able to see for myself how this fishery has become more sustainably managed, and is certified by the Marine Stewardship Council. There has been enormous progress in reducing by-catch, including the inadvertent capture and killing of remarkable seabirds such as the albatross. The work done here by remarkable organizations like Bird Life International through their "S.O.S. - Save our Seabirds" initiative, is, I think, a wonderful example of what can be achieved with the right kind of leadership.

I am happy to say that my International Sustainability Unit, or I.S.U., has been drawing inspiration from this work and that of other leading fisheries to help facilitate a consensus on possible ways forward – in the same way, incidentally, as it has been trying to find innovative

ways of avoiding the disastrous destruction of the world's precious rainforests – all to promote more resilient and sustainable fisheries. And to my great relief, a consensus is beginning to emerge. The focus is on the better management of fisheries so that they produce not only more food, but also much greater economic gain. One widely quoted estimate from the World Bank and their "Sunken Billions" research suggests that if the world's fisheries were better managed their value could increase by some fifty billion dollars a year. This is why, in consultation with the global fishing industry, with N.G.O.'s and international agencies, we have been looking into how this can be achieved and I have been greatly encouraged to find that there are three points where broad agreement appears to exist.

The first is the recognition that we have to take an ecosystem-based approach towards the management of fisheries, rather than exploiting them without proper consideration for the natural systems that sustain them. This requires better research and methods of data collection. We also need to think about planning; about different kinds of property rights and using alternative forms of fishing gear. Again, the South African hake fishery is emerging as a leader as it attempts to manage the whole system, rather than setting a particular target population of fish.

The second part of the jigsaw is to ensure that proper governance is in place. The process needs to be properly monitored and enforced and illegal fishing controlled. Without this, there is often little chance of establishing the sustainable management of fish stocks. However, cheap and widely available technology is available that can identify individual vessels.

The third point of agreement is around the need to alter the economics of fisheries, so that people in the industry can make a good living while, at the same time, the resource is properly managed. The range of options includes the use of certification to gain better market access for more sustainable fish, as your own hake fishery is now using. At the same time, I cannot help but wonder if it might also be possible to reorientate the focus of some public subsidies so that they employ measures to encourage private investment in more sustainable fisheries?

It seems to me, ladies and gentlemen, that we have a range of approaches that could make a very big difference indeed and create a more resilient and sustainable food system, both on land and at sea. I believe that we can do this while, at the same time, conserving the natural capital – the entire, complex, often delicately balanced ecosystems that are the ultimate source of all our wealth. And that includes the incredible biological diversity that makes areas of the world like South Africa so beautiful and so uniquely precious for our future survival.

The issues are complex and the connections between them are many and varied, but I believe that through dialogue we can find ways that will be of benefit to the many different interests, organizations and countries that must be part of the solution. To that end, I hosted a meeting a few days ago in London which brought together representatives of the REDD+, Climate Smart Agriculture and agriculture sustainable round table communities – a meeting , I am delighted to say, that was attended by your Minister of Agriculture, Mrs. Joemat Pettersson. I was heartened to see – and I think some of them were slightly surprised to discover! – that not only do their goals overlap, but so too their conditions for success. I am talking here particularly about co-ordination, planning at national and sub-national levels and about the ability to reach out to people on the ground. I hope that this meeting may, if nothing else,

generate a shared understanding of what might be achieved if everyone works together rather than in isolation.

In fact it is an example, if I may say so, of what could happen if there was a willingness on the part of different constituencies to seek the solutions that lie behind the apparent wall of paralyzing dilemmas and conflicts. I have found time and again that dialogues like this can help to reveal some of the many opportunities that exist. For instance – and this is of enormous and topical importance – I wonder if this might also apply to the increasingly complex issue of foreign investment into agricultural land in emerging economies? This investment, given the need for the injection of foreign capital into agricultural productivity, should in many ways be welcome. It is absolutely essential, but it surely has to be done with particularly careful regard to how it affects both the people on the ground and the natural systems and environment? It is perhaps of note that the World Bank reported that, in 2009 alone, deals were announced that concerned some fifty-six million hectares of large-scale farmland, and that the most attractive countries for such investment were in Sub-Saharan Africa.

It seems to me absolutely essential, though, that such an investment is mindful of its impact on communities and natural systems. Indeed, I can only echo the words of Kofi Annan who recently said how very disturbing it was to read a report which found that agricultural land "that adds up to the size of France was bought in Africa in 2009 by hedge funds and other speculators." And he added, "It is neither just, nor sustainable, for farmland to be taken away from communities in this way, nor for food to be exported when there is hunger on the doorstep." Investments of this kind may generate significant profits for those involved, but experience cautions that this kind of investment is full of risks. It is profoundly distressing to learn of numerous rural communities being evicted from their ancestral lands in the headwaters and upper floodplains of great rivers like the Nile and Niger to make way for export-oriented estates whose giant irrigation canals may permanently destroy swamps that are crucial for both the region's biodiversity and traditional ways of life, including those downstream. Or the threat to Lake Turkana that supports the peoples and desert ecosystems of much of Northern Kenya and neighboring Southwest Ethiopia, including two World Heritage Sites, which would be devastated if its main source of water, the Omo River, were to be dammed and diverted for sugar and biofuels. Surely Africa needs to heed the lessons from tragedies elsewhere, like the desiccation of the Aral Sea that resulted from similar developments to produce much more cotton, but created far reaching consequences of unimaginable proportions.

And the Nobel Laureate, Wangari Maathai - whose tragic loss I can only mourn with all my heart - consistently pointed out how the devastating impact of such acquisitions not only threatens precious environments, but also the lives and wellbeing of thousands of ordinary people. With remarkable courage she showed, above all, how much can be achieved with local knowledge, skills and the energy of the people on the ground. She was always clear that this will not be achieved if the system depends entirely upon importing large scale or top-down technocratic solutions.

In company with many, I wonder if greater returns could come for Africa if attention were paid to backing the continent's millions of smallholders? And yet, as I speak, many are being driven off their land and swelling the ranks of the urban dispossessed. Is this what we really want as the only answer to so-called food security? I do not see small farmers as backward relics of the past. In fact, I see them as an utterly crucial cornerstone of the future, just as they

are becoming in other parts of the world. This is because smallholders typically understand the complexities of their local environments. They also have the capacity to innovate and test new approaches – a skill which is often under-appreciated. And, by virtue of the traditions they adhere to, they are often the people who are not swayed by the pressures of short termism that can dog the corporate world. Instead, they tend to think about the long-term, with a focus on the health of their soils and the coherence of their communities. They can make a very considerable difference, if they can be protected from the ravages of extreme poverty and insecure land tenure and be allowed to farm using techniques which are appropriate to their complex and variable environments.

Traditional techniques also promise a degree of insulation from the ever more costly business of using fossil-fuel dependent, artificial inputs. Sustainable, agro-ecological approaches are the ones that could produce the sorts of diverse foods that Africa needs. It is these techniques that will prove resilient in the face of the challenging economic and environmental problems we all now face. And in case you are wondering, it is not just me saying this... An impeccably well-researched International Assessment of Agricultural Knowledge, Science and Technology for Development, conducted by the U.N. in 2008 drew on evidence from a wide range of international scientists and concluded that small-scale, family-based farming systems, adopting agro-ecological approaches, were among the most productive systems in developing countries. So, with the right policies, with strong but wise investment and other support, including access to markets that value the quality of their products, these people are key. Their conclusion, in short, was that Africa depends upon the grass roots entrepreneurship of its own citizens.

Tragically, many of the land acquisitions do not encourage this kind of development with its emphasis on the viability of smallholder economics and, it appears, they may lead to serious social and environmental problems. One of the issues apparently is that, until it is too late, it is very difficult for many of the stakeholders to have a clear understanding of the size, type and implications of these investments. There is, then, an urgent need for greater transparency in land deals so that communities, and Africa as a whole, can evaluate which investments are in their best interests.

What would also help is if investors could be encouraged to take a more considered approach, and to incorporate not only an assessment of the financial returns, but also what can be achieved socially and environmentally. From what I know of this intricate subject, I would have thought that investors would find this a sound strategy. Indeed, if investors better understood these wider and deeper questions and managed the way their investments were employed properly, they might well be less exposed to financial risk…

With this in mind, the World Bank and the U.N.'s Food and Agriculture Organization have both published principles intended to set standards for good practice. I am pleased to say that some leading investors are now prioritizing projects that have a positive environmental and social outcome. There is certainly a glimmer of hope from the fact that a small group of Pension Funds has adopted a set of "Principles for Responsible Investment in Farmland." It is also worth considering the view of the U.N.'s Special Rapporteur on the Right to Food, Mr. Olivier De Schutter, who has pointed out that these positive measures will be most effective when first grounded in local land rights and good governance.

However, if we are to improve agricultural productivity – but in a way which supports smallholder farming – then those very smallholders need to have access to the appropriate

education, training and skills if they are to be successful and sustainable. Around the world, as much in Europe as in Africa, these so-called "agricultural extension services" have more or less disappeared. Education for the farming community, as often as not, now comes veiled by the vested interests of a fertilizer or pesticide salesman… Given the challenges we are facing, ladies and gentlemen, investment into these "extension services" is of the greatest importance. Indeed, without it, it seems hard to imagine how a genuinely sustainable rural economy can be built.

Looking across all these themes it seems to me that an important opportunity exists to bring together the narratives of climate change, sustainable development and economic stability (surely the very bedrocks of national security…). These are currently encapsulated – although separately and distinctly – in the forthcoming COP17 in Durban, the Rio+ 20 conference and G20 meetings. Might it not, therefore, be worth considering a mechanism by which these themes could be brought together to achieve a much-required strategic and tactical response to the challenges arising from the depletion of our natural capital?

On a practical level, one starting point might be to ensure that we use the data collated on energy, water, agriculture, biodiversity and climate change to compose a full picture of what is actually going on, and then to use this picture to calculate the real cost of our current use of natural capital. Surely an evaluation of that cost on an on-going basis is the bare minimum we need if we are to develop effective policies that address food security, poverty and climate change, and so build properly resilient economic systems – green economies, if you will – that have the capacity to adapt to what will, from now on, be very rapidly changing circumstances?

Let us not forget that such reviews – arriving at an internationally agreed cost of action versus inaction – have helped crystallize minds and thinking in the past… As former President Nelson Mandela so wisely once said, "it always seems impossible, until it is done." If it is not done, all I can say is that our children and grandchildren will face a disastrously compromised future…

APPENDIX A.VI.: John Kerry, 2012, ‘‘Kerry: On Eve of Rio+20, An Honest Assessment of Climate Change Challenge’’

Transcript retrieved from http://www.foreign.senate.gov/press/chair/release/kerry-on-eve-of-rio20-an-honest-assessment-of-climate-change-challenge on 03 June 2014. United States Senate Committee on Foreign Relations. Transcriber unknown.

John Kerry: Speech on Climate Change

WASHINGTON, DC – As world global climate change.

The conference, which takes place June 20 – 22 in Rio de Janeiro, Brazil, marks the 20th anniversary of the 1992 United Nations Conference on Environment and Development (UNCED) in Rio, which Senator Kerry attended along with almost every other conference held.

“Twenty years ago this month, a Republican President of the United States helped bring together all the world’s largest economies in Rio to confront the issue of global climate change. The President was unequivocal about the mission. George Herbert Walker Bush said simply, ‘The United States fully intends to be the world’s preeminent leader in protecting the global environment,’” said Sen. Kerry. “How dramatic and sad it is that twenty years later, shockingly, we find ourselves in a strange and dangerous place on this issue—a place this former President wouldn’t even recognize. When it comes to the challenge of climate change, the falsehood of today’s naysayers is only matched by the complacency of our political system...We should be compelled to fight today’s insidious conspiracy of silence on climate change—a silence that empowers misinformation and mythology to grow where science and truth should prevail. It is a conspiracy that has not just stalled, but demonized any constructive effort to put America in a position to lead the world on this issue, as President Bush promised we would and as Americans have a right to expect we will.”

Senator Kerry is the leading advocate in the United States Senate for action to address international climate change. In 2010, he formed a tri-partisan climate effort with Senators Lindsey Graham (R-S.C.) and Joe Lieberman (I-Conn.) to produce the “American Power Act,” comprehensive climate change legislation in the Senate. In 2009, the Senator traveled to China to urge leaders to join the upcoming “cap and trade” negotiations ahead of the UN Climate Summit in Copenhagen, where he helped forge a political agreement on global greenhouse gas reduction. He has also represented U.S. at international climate negotiations for two decades: Rio,’92, Kyoto, ’97, Buenos Aires, ’98, The Hague, ’00, Bali, ’07, Poznan, ’08, and Copenhagen, ’09.

[…]

The Senator’s full floor statement, as prepared, is below:

Mr. President: Twenty years ago this month, a Republican President of the United States helped bring together all the world’s largest economies in Rio to confront the issue of global climate change. The President was unequivocal about the mission. George Herbert Walker Bush said simply, “The United States fully intends to be the world's preeminent leader in protecting the global environment. We have been that for many years. We will remain so. We believe that environment and development...can and should go hand in hand. A growing

economy creates the resources necessary for environmental protection, and environmental protection makes growth sustainable over the long term."

When he was asked about his own target for subsequent meetings of the global stakeholders, he could not have been clearer. He said the United States "will be there with specific plans, prepared to share, but more important, that others who have signed these documents ought to have specific plans. So I think this is a leadership role. We are challenging them to come forward. We will be there. I think the Third World and others are entitled to know that the commitments made are going to be commitments kept."

How dramatic and sad it is that twenty years later, shockingly, we find ourselves in a strange and dangerous place on this issue—a place this former President wouldn't even recognize.

Thomas Paine actually described today's situation very well. As America fought for its independence, he said: "It is an affront to treat falsehood with complaisance." Yet when it comes to the challenge of climate change, the falsehood of today's naysayers is only matched by the complacency of our political system.

It is well past time that we heed Thomas Paine's admonition and reaffirm the commitment made by the first President Bush. As a matter of conscience and common sense, we should be compelled to fight today's insidious conspiracy of silence on climate change—a silence that empowers misinformation and mythology to grow where science and truth should prevail. It is a conspiracy that has not just stalled, but demonized any constructive effort to put America in a position to lead the world on this issue, as President Bush promised we would and as Americans have a right to expect we will.

Mr. President, the danger we face could not be more real. In the United States, a calculated campaign of disinformation has steadily beaten back the consensus momentum for action on climate change and replaced it with timidity by proponents in the face of millions of dollars of phony, contrived "talking points," illogical and wholly unscientific propositions and a general scorn for the truth wrapped in false threats about job loss and taxes.

Yet today, the naysayers escape all accountability to the truth. The media hardly murmurs when a candidate for President of the United States in 2012 can walk away from previously held positions to announce that the evidence is not yet there about the impact of greenhouse gases on climate.

The truth is, scientists have known since the 1800s that carbon dioxide and other greenhouse gases trap heat in our atmosphere. With the right amount of these gases, the Earth is a hospitable place for us to live. But if you add too much, which is what we're doing right now, at a record pace, temperatures inevitably rise to record-setting levels. It's not rocket science.

ignoring the facts

Every major national science academy in the world has reported that global warming is real. It is nothing less than shocking when people in a position of authority can just say—without documentation, without accepted scientific research, without peer reviewed analysis—just stand up and say that there isn't enough evidence because it suits their political purposes to serve some interest that doesn't want to change the status quo.

Facts that beg for an unprecedented public response are met with unsubstantiated, even totally contradicted denial. And those who deny have never, ever met their de minimus responsibility to provide some scientific answer to what, if not human behavior, is causing

the increase in greenhouse gas particulates and how, if not by curbing greenhouse gases, we will address this crisis. In fact, when one measures the effect of taking action versus not taking action, the naysayers' case is even more confounding.

Just think about it: If the proponents of action were somehow incorrect, contrary to all that science declares, but nevertheless we proceeded to reduce carbon and other gases released into the atmosphere, what is the worst that would happen? Well, under that scenario the "worst" will be more jobs; the opening of a whole new $6 trillion dollar energy market with a more sustainable policy; a healthier population because of cleaner air and reduced expenditure on health care because of environmentally induced disease; an improved outlook for the oceans and ecosystems affected by pollution falling to earth and sea; and surely, greater security for our country because of less dependence on foreign sources of energy and a stronger economy. That's the worst that will happen.

And what if the naysayers are, in fact, wrong as all science says they are? What if, because of their ignorance, we failed to take the action we should—what is the worst then? The worst then, is sheer, utter disaster for the planet and all who inhabit it. So whose "worst" would most thinking people rather endure?

The level of dissembling—of outright falsifying of information, of greedy appeal to fear tactics that has stalled meaningful action now for twenty years—is hard to wrap one's mind around. It is so far removed from legitimate analysis that it confounds for its devilishly simple appeal to the lowest common denominator of disinformation. In the face of a massive and growing body of scientific evidence that says catastrophic climate change is knocking at our door, the naysayers just happily tell us climate change doesn't exist.

In the face of melting glaciers and ice caps in the Arctic, Greenland and Antarctica, they say we need to "warm up to the truth."

And in the face of animals disappearing at alarming rates, they would have us adopt an "ostrich" policy and simply bury our heads in the sand.

Just last week, a group of state senators in North Carolina passed a bill that bans planning for rising sea levels when creating rules for housing developments and infrastructure in coastal communities. Jeffress Williams is the lead author of the U.S. National Climate Assessment Report. Ask him what he thinks about this legislation and he'll tell you that it's "not based on sound science." And he's right. But somehow the state senators that voted for this bill know better.

confronting a conspiracy of silence

Al Gore spoke of the "assault on reason." Well, Exhibit A is staring us in the face: Coalitions of politicians and special interests that peddle science fiction over science fact. A paid-for, multi-million dollar effort that twists and turns the evidence until it's gnarled beyond recognition. And tidal waves of cash that back a status quo of recklessness and inaction over responsibility and change. In short, it's a story of disgraceful denial, back-pedaling and delay that has brought us perilously close to a climate change catastrophe.

Nothing underscores this Orwellian twist of logic more than the facts surrounding the now well negatively branded Cap and Trade program. Cap and Trade was a Republican inspired idea created during the debate over ozone and the Montreal Protocol in the 1980s. It was actually inspired by conservatives looking for the least command and control, least Government regulated way to meet pollution standards. It was implemented and it worked.

And it is still working. But low and behold, when the strategists for the political right decided to make it a target because Democrats were leading the charge to address climate change, suddenly, this Free Market mechanism was transformed into "Cap and Tax," and a "job killing tax" with guess who—COAL—the leading carbon polluter, leading the effort.

What's worse, we've stood by and let it all happen—we've treated falsehood with complacence and allowed a conspiracy of silence on climate change to infiltrate our politics. Believe me—we've had our chances to act. But every time we get close to achieving something big for our country, small-minded appeals to the politics of the moment block the way.

The conspiracy of silence that now characterizes Washington's handling of the climate issue is dangerous. Climate change is one of two or three of the most serious threats our country now faces, if not the most serious, and the silence that has enveloped a once robust debate is staggering for its irresponsibility. The costs of inaction get more and more expensive the longer we wait—and the longer we wait, the less likely we are to avoid the worst and leave future generations with a sustainable planet.

In many cases, what we're talking about here is vast sums of money funneled into gas-guzzling industries and coal-fired power plants. We're talking about pollution on a wide scale—the kind of dirty, thick and suffocating smog that poisons our rivers, advances chronic diseases like asthma and lung cancer, and creates billions in hospital costs and lost economic opportunity.

It's the same pollution that Rachel Carson warned us about in "Silent Spring," when she said:

"Why should we tolerate a diet of weak poisons, a home in insipid surroundings, a circle of acquaintances who are not quite our enemies, the noise of motors with just enough relief to prevent insanity? Who would want to live in a world which is just not quite fatal?"

Well today, we do live in a world where there's an absurdity in the air. And it's got complacence written all over it. Fish are dying in water polluted with pesticide. Roadless forests are being threatened by indiscriminate drilling. Industrial chemicals are seeping into all of us, and the burning of fossil fuels has overloaded ecosystems with nitrogen and ravaged our plant life. Bottom line: we've substituted fantasy for reason—sheer whimsy for proven epidemiology—and it's wreaking havoc on our environment.

You don't have to take my word for it. You can see it across the planet with your own eyes: The ice caps are melting. Seas are rising. Deserts are spreading. Storms are more frequent, more violent and more destructive. And pollution, famine and natural disasters are killing millions of people every year. These are changes that many experts thought were still years down the line, but climate change is radically altering our planet at a rate much faster than even the pessimists expected.

All you need to do is look out your window. We just had the warmest March on record for the contiguous United States. The naysayers will tell you that one hot year doesn't prove global warming; but year after year, new records are being set. This isn't an anomaly—it's a giant step in the wrong direction. 2010 was the hottest year on record, and the last decade was the hottest decade since we've started recording the weather. And April, May, and June of this year are continuing the trend.

For the first time in memory, the Augusta National azaleas bloomed and wilted before the first golfers teed off at this year's Masters.

And at the Boston Marathon, temperatures hit 89 degrees Fahrenheit, more than 30 degrees higher than average. Official jackets, gloves and coffee? Are you kidding? How about hats, sunscreen and Gatorade—and medical tents filled with heat-exhausted runners starting at mile ten of the 26-mile course from Main Street in Hopkington to Bolyston Street in Boston.

connecting the dots

I've been working to connect the dots on this issue for a long time. In 1988, on an already hot June day, Al Gore and I held the first Senate hearings on climate change, during which Jim Hansen testified that the threat was real. Four years later, we joined a delegation of Senators to attend the first Earth Summit in Rio, where we worked with 171 other nations to put in place a voluntary framework on climate change and greenhouse gas reductions.

Back in 1992, we all came together for a simple reason: We accepted the science. President George H. W. Bush personally traveled to climate talks in Rio to help plant the seeds of a new beginning. We knew the road ahead would be long. But we also knew that this was a watershed moment—that it created the kind of grassroots momentum that made people sit up and start to listen to the damage we were doing to the environment.

And sit up and listen they did. The principles that came out of Rio transformed into mandatory requirements under the Kyoto Protocol. Each nation had accepted its own target goal. The European Union reduction would be eight percent; Japan's would be six percent, and so on. We were thinking big: Our goal was to reach a total decrease in global emissions of 5.2 percent below 1990s levels by the year 2010.

Well, 2010 has come and gone—and so, too, have the targets. We all know the story: global political leadership was distracted or absent. International negotiations in Buenos Aires and The Hague turned tense. The less developed nations saw the targets and timetables for greenhouse gas reductions as a "western market conspiracy." And then there were the trumped-up, industry funded so-called "studies" that challenged the scientific assertions for climate change scenarios.

Looking back, it's not hard to understand why the final agreement got sidetracked in the Senate. After all, developing countries were excluded from the treaty's reduction targets, even though it had become clear that China and India were significant enough as industrial powers that to exempt them entirely would be a mistake. Nations left out were deemed capable of undoing all the reductions achieved by developed nations! American companies were understandably reluctant to put themselves at a competitive disadvantage, and many in Congress had not yet woken up to the realities of climate change—though, as we know, climate scientists were already studying the phenomenon of greenhouse gases and taking a serious look at the data.

So the question is not whether the treaty had its flaws. The question is whether we got the fundamentals right—and I believe we did. As I remind colleagues: The view from 2012 looks a whole lot different than 1992.

Countries like China, South Africa, Brazil and South Korea have now made far-reaching choices to reshape their economies and move forward in a new and very different global era. Take China. It is already outspending the United States three to one on public clean energy projects. And last year alone, it accounted for almost a fifth of renewable energy investment, with the United States and Germany trailing behind. Steven Chu, the secretary of energy, said

it best: “For centuries, America has led the world in innovation. Today, that leadership is at risk.”

So, the United States is now the laggard—and we’re missing out on achieving sustained economic growth by securing enduring competitive advantage through innovation.

The facts speak for themselves. Today’s energy economy is a $6 trillion market with four billion users worldwide—growing to 9 billion in 40 years and the fastest growing segment of that is green energy—projected at $2.3 trillion in 2020. America needs to get its skin in the game here or we will miss the market of the future—if not the future itself. And I’ll tell you something else: We would be delusional to believe China, or any other of our competitors, will sit on the sidelines and let this market opportunity fall through the cracks.

time is running out

I realize that some will argue we cannot afford to address climate change in these tough economic times. But nothing could be further from the truth and nothing could be more self-defeating. We will recover from this slowdown. And when we do, we need to emerge as the world’s leader in the new energy economy. That will be a crucial part of restoring America as a nation that measures prosperity in terms of hard work and innovation. Anyone who worries whether this is the right moment to tackle climate change should understand: We can’t afford not to act now.

It is now that the most critical trends and facts all point in the wrong direction. The CO2 emissions that cause climate change grew at a rate four times faster in the first decade of this new century than they did in the 1990s. Several years ago, the UN’s Intergovernmental Panel on Climate Change issued a series of projections for global emissions, based on likely energy and land use patterns. Today, our emissions have actually moved beyond the worst case scenarios predicted by all of the models of the IPCC! Meanwhile, our oceans and forests, which act as natural repositories, are losing their ability to absorb carbon dioxide. This means that the effects of climate change are being felt stronger than expected, faster than expected.

The plain fact is that there isn’t a nation on the planet that has escaped the steady onslaught of climate change. When the desert is creeping into East Africa, and ever more scarce resources push farmers and herders into deadly conflict, then that is a matter of shared security for all of us. When the people of the Maldives are forced to abandon a place they’ve called home for hundreds of years—it’s a stain on our collective conscience, and a moral challenge to each of us. When our own grandchildren risk growing up a world we can’t recognize and don’t want to, in the long shadow of a global failure to cooperate, then—clearly, urgently, profoundly—we all need to do better.

Frankly, those who look for any excuse to continue challenging the science have a fundamental responsibility that they have never fulfilled: Prove us wrong or stand down. Prove that the pollution we put in the atmosphere is not having the harmful effect we know it is. Tell us where the gases go and what they do. Pony up one single, cogent, legitimate, scholarly analysis. Prove that the ocean isn’t actually rising; prove that the ice caps aren’t melting, that deserts aren’t expanding. And prove that human beings have nothing to do with any of it.

And by the way—good luck in the effort! Because there are over 6,000 peer-reviewed articles, all of which document clearly and irrefutably the ways in which mankind is contributing to this problem. Sure we know the naysayers have their two-bit scientists who

trade in doubt and misdirection about things like sun spots and clouds. But there's not a single credible scientist that will argue climate change isn't happening.

In fact, even the naysayers are starting to come to their senses. Just this year, a well-known climate skeptic, Dr. Richard Mueller, released a series of reports that were funded in part by the Koch brothers. Dr. Mueller thought his results would show something different than all of the other climate studies. Think he found what the Koch brothers were looking for? Here's Dr. Mueller in his own words: "You should not be a skeptic, at least not any longer." Bottom line: his studies found what all other credible climate studies have been telling us for decades—that global warming is real.

And if you just stop and look around for a moment, you'll see that its effects are everywhere: floods and droughts, pathogens and disease, species and habitat loss, and sea level rise and storm surge that threaten our cities and coastlines. No continent is escaping unscathed: Increasing ground instability in permafrost regions, increasing avalanches in mountainous zones, warmer and drier conditions in the Sahelian region of Africa leading to a shortened growing season, and coral bleaching events in the Great Barrier Reef.

the cold, hard, stubborn facts about climate change

I want to take a moment to drill down on the science—on the cold, hard, stubborn facts that must guide us in addressing this challenge. I know it's detailed, but it's the very detail detractors can never address or refute and it's important to see the detail in all its cumulative force. Unlike the naysayers, I will respond point by point to the falsehoods and lay out a summary of critical evidence that should lead America—and the world—to action.

Here's what the science is telling us: Atmospheric carbon dioxide levels have increased by nearly 40 percent in the industrial era, from 280 to over 393 parts carbon dioxide for every million particles in the atmosphere. And, before long, we're likely to see global average concentrations of CO2 at 400ppm. Within the last few months, monitoring stations in the Arctic region for the first time reported average concentrations of CO2 at 400 parts per million. Because of the remote nature of the monitors, they generally reflect long-term trends as opposed to fluctuations in direct emissions near population centers.

As atmospheric scientist Pieter Tans with the National Oceanic and Atmospheric Association (NOAA) points out, "The northern sites in our monitoring network tell us what is coming soon to the globe as a whole...We will likely see global average CO2 concentrations reach 400 ppm about 2016."

Scientists have warned that anything above 450ppm—a warming of two degrees Celsius—could lead to severe, widespread and irreversible harm to human life on this planet. When concentrations of other greenhouse gases, like methane and black carbon, are factored into the equation, the analysis suggests that stabilizing concentrations around 400ppm of "equivalent carbon dioxide" would give us about an 80 percent chance of avoiding a two degree Fahrenheit increase above present average global temperature.

Considering what a two degree Fahrenheit increase could mean, scientists prefer not to take their chances. James Hansen, director of the NASA Goddard Institute for Space Studies, has done the math. His analysis shows that we need to be shooting for a stabilization level of 350ppm to increase our chances of avoiding a two degree Fahrenheit increase. That's a target we've obviously already exceeded. If we don't slam on the breaks now, we could be headed

for a global temperature increase of two to four degrees Celsius by century's end, and greater warming after that.

an avalanche of evidence

So what do these "postcards from the edge" look like? Let me walk through what is happening to our air, our health, and our environment.

A Warming Planet

Let me start with warming temperatures. The first ten years of this century were the warmest decade on record—and 2010 was tied with 2005 as the hottest year ever recorded.

The National Oceanic and Atmospheric Administration has reported that 2011 was the second warmest summer on record—just 0.1 degrees Fahrenheit below the 1936 record—and the U.S. Climate Extremes Index, a measure of the area of the country experiencing extreme conditions, was nearly four times the average.

Last year, many northeastern states experienced some of their wettest summers—especially those states caught in Hurricane Irene's destructive path. Meanwhile, persistent heat and below average precipitation across the southern United States created record-breaking droughts in Louisiana, New Mexico, Oklahoma, and Texas of greater intensity than the 1930's "Dust Bowl." Texas endured the country's hottest summer ever recorded for any state at an average temperature of 86.8 degrees.

What's shocking is that the evidence of a warming planet is coming in faster and clearer every year. These graphs here show temperature changes from 1912 to 2011. See how the warming accelerates after 1970?

According to a new climate report from NOAA, the lower 48 states elbowed their way into the record books this spring with—and I quote: "the warmest March, third warmest April, and second warmest May…the first time that all three months during the spring season ranked among the 10 warmest, since records began in 1895." In fact, the average temperature this spring was so far off the charts that the lower 48 beat out the old 1910 record by an astonishing two degrees Fahrenheit!

Inland, worsening conditions will create persistent drought in the Southwest United States and significantly increase Western wildfire burn area. The National Academy of Sciences has confirmed that the effects may be irreversible for a thousand years. Just look at the damage already wrought by pine bark beetles in the Rocky Mountains. For thousands of years, pine beetles were not a particular problem—their populations were kept in check by reliable winter frosts. But in recent years, due to warmer winters, pine beetle populations have exploded, devastating these once majestic forests.

Health Impacts

Let me say something here about what this is doing to our health, because it's particularly important and many people are just not aware of it.

As average temperatures rise, we can expect to see more extreme heat waves during our summers, which, as we know from history, can seriously impact people with heart problems and asthma, the elderly, the very young, and the homeless. In the United States, Chicago is

projected to have 25 percent more frequent heat wave days by the end of the century. In Los Angeles, we could see as much as a four- to eightfold increase.

Climate change may also heighten the risk of infectious diseases, particularly diseases found in warm areas and spread by mosquitos and other insects—like malaria, dengue fever and yellow fever. In some places, climate change is already altering the pattern of disease. In the Kenyan highlands, for example, it's now one of the major drivers of malaria epidemics.

And it's not just the health costs that are sounding the alarm. As many of you have seen with your own eyes, the Arctic is among the most startling places to witness the adverse effects of global climate change. Great sheets of ice have been calving off glaciers, marine mammals are struggling to survive, and where there used to be only frozen landscapes, now there is open water.

Changing Arctic

Every new report that's published suggests the situation is getting grimmer. Last year, the multi-country Arctic Monitoring and Assessment Program released a new assessment of the impact of climate change in the Arctic. It found that the period from 2005 to 2010 was the warmest ever recorded. According to AMAP ["A-map"] researchers, the changes in ice melt over the past ten years "are dramatic and represent an obvious departure from the long-term patterns."

Their conclusion is startling: they expect the Arctic Ocean to be nearly ice-free within this century, likely in the next 30 to 40 years.

Think about that for a second: Within our children's lifetimes, one of Earth's polar caps will be completely gone. Average annual temperatures in the Arctic have increased at approximately twice the rate of average global temperatures. Within a generation—maybe two—kids will grow up learning geography on maps and globes that show simply an empty blue expanse on the top of the world.

In terms of impact, all of us who have been following this issue understand that the melting of the Arctic is at least partly mitigated by the fact that the ice is already afloat. But if there's ice melt from glaciers, as we're seeing not only in the Arctic, Greenland and Antarctica, but also in North America, South America and Africa—when you realize that all over the globe, glaciers and ice caps are losing volume—that means other day-to-day, practical problems for our communities.

Melting Glaciers and Permafrost

Many of you may not know that there are hundreds of communities in America that rely on annual glacial melt for municipal water supplies and hydropower. Just ask Washington State, where glacial melt water provides 1.8 trillion liters of water every summer. Or talk to folks in Alaska, where glacier melt plays a key role in the circulation of the Gulf of Alaska, which is important to maintaining the very, very valuable fisheries—halibut and salmon—that reside in this body of water.

Again, the skeptics will say, "Look, there are some glaciers that are actually expanding." And yes, there are some glaciers that are responding to unusual and unique local conditions and increasing in snow and ice accumulation. But again, the overwhelming evidence is that most of America's glaciers are shrinking. Over the last four decades of the 20th century, North

American glaciers lost some 108 cubic miles of ice—that's enough to inundate California, Arizona, Nevada, Utah, and Colorado with one foot of water!

In 1850, there were approximately 150 glaciers in what is now Glacier National Park. Today, due to warmer temperatures, there are only 25 named glaciers remaining, and some models predict that the Park's glaciers could disappear in just a few decades. But trust your own eyes, if you prefer. Look at photographs that depict glacial melt over various time periods in Glacier National Park, Montana and Holgate Glacier and Icy Bay, Alaska. As you'll see, the effects are just staggering.

We all remember Wordsworth's lines about "the Lake that was shining clear among the hoary mountains." Well, these mountains are no longer hoary, and soon, lakes will reflect not snow-covered peaks, but naked ridges and sun-splashed steeps.

And to make matters worse, temperatures are likely to increase exponentially in the coming years. Because the environment is a closed system, the more conditions change, the faster they change. As the ice and permafrost melts, methane plumes under the surface have begun venting into the atmosphere. During a survey last summer of the East Siberian Arctic seas, a team of scientists encountered a high density of plumes—some more than a kilometer across—emitting methane into the atmosphere at concentrations up to 100 times higher than normal. If that process continues, we're in real trouble since methane is a potent greenhouse gas: over a period of 100 years, it has a warming potential roughly 25 times greater than CO2.

In part, we may become the victims of vicious feedback cycles in our climate system. Cycles associated with less cloud cover, changes in aerosols, peatlands, soils, and Arctic ice cover can all lead to accelerated climate change. One study estimated that thawing permafrost may turn the Arctic from a carbon sink—a place that stores carbon—to a carbon source by the mid-2020s, releasing 100 billion tons of carbon by 2100. What does that mean? One hundred billion tons of carbon is about equal to the amount of CO2 that would be released worldwide from ten years of burning fossil fuels. That's the future, folks—and it's bleak if we don't act.

Rising Sea Levels: An "Invisible Tsunami"

Here's another "postcard from the edge": rising sea levels. You'll recall that some senators in the state legislature in North Carolina don't think it's much of a problem.

Well, let's take a look at the evidence. Our best studies predict a higher sea level rise than previously projected. With the melting of the West Antarctic Ice Sheet alone, global sea levels could rise by as much as 3.26 meters in the coming years. And the Pacific and Atlantic coasts may be in for a 25 percent increase above average levels by century's end. In all, the melting of the Greenland ice sheet has the potential to raise global sea level by about seven meters, and the ice sheets of Antarctica have the potential to contribute to 60 meters of sea level rise.

Think about what this means. As the *New York Times* reported in March, some 3.7 million Americans living within a few feet of high tide are at risk from the rising sea. So all you state senators out there, listen up: The effects of climate change will spare no one—from Tampa to Asheville, from Sausalito to Staten Island, all coastal communities are vulnerable.

Benjamin Strauss, co-author of a smart new study on topographic vulnerability, said it best: "Sea level rise is like an invisible tsunami, building force while we do almost nothing…We have a closing window of time to prevent the worst by preparing for higher seas." I think

that's exactly right—and it's why, in cities like Boston, officials are actively planning for how to manage 100-year floods that are now arriving every twenty years in the face of a global sea level rise of three to six feet by 2100.

So, we can pass legislation at the state level to ban planning for sea level rise. It might be easy politics, but it's not smart politics in terms of protecting our country. Just ask those living in Tuvalu and the low-lying nation of Kiribati. Think they could use some advance planning to deal with the "King" tides that may soon drown out life on their shores? You bet. But instead of learning from them, we've succumbed to the siren call of short-term interests.

One resident of Tuvalu poignantly asked: "What will happen to us in 10 years' time?" I wish I could allay her fears. I wish I could tell her that the climate challenge would only be limited to occasional sea level rise, and that—naturally, surely—the King tides would recede.

Raging Floods and Water Scarcity

But the truth is much more harrowing. From Veracruz to Songkhla Province in Thailand, floods are devastating crops and stealing away opportunities for millions. On my travels, I've seen children orphaned by raging floodwaters, families deprived of basic necessities like food, clean drinking water and medicine. I've also seen the ways in which climatic changes interact with conflict, food insecurity and water scarcity. Think of Darfur and tensions over arable land. Think of drought in Syria and its impact on farmers in southern Dara'a. Think of water scarcity in Yemen—and the list goes on.

These are the "invisible tsunamis" that Benjamin Strauss spoke of. They develop slowly, quietly, determinately. And they devastate communities just as surely as they renew our sense of urgency about the costs of inaction.

the big, costly picture

The fact is, unmitigated climate change is wreaking havoc on economies—and it will only get worse unless we act.

Just ask Professor Frank Ackerman, a prominent economist at Tufts University. He found that inaction in the face of climate change could cost the American economy more than 3.6 percent of GDP—or $3.8 trillion annually—by the end of the century.

And he's not alone. Harvard economist Joseph Aldy estimates that if temperatures push past the 2 degrees Celsius benchmark to 2.5 degrees Celsius above pre-industrial levels, the annual damages could amount to one to two percent of world GDP by 2100—and as high as two to four percent of world GDP if we push above four degrees Celsius.

Developing countries will face similar costs. According to a major international initiative on "The Economics of Ecosystems and Biodiversity," developing countries will spend an estimated $70 to $100 billion a year from 2010 to 2050 just to adapt to a two degrees Celsius change in global temperatures, with the majority spent on protecting infrastructure and coastal zones, managing the water supply and protecting against the effects of floods.

The "grow now, clean later" approach is no longer viable—if it ever was. Before you know it, one quarter of the world's land surface will bear the marks of soil erosion, salinization, nutrient depletion and desertification. Imagine what this will do to agricultural productivity and water supplies.

Another way of looking at this is to consider not the costs, but the economic benefits of keeping our ecosystems intact.

Back in 2005, the World Bank estimated the total value of the world's natural assets to be $44 trillion. The countries that manage their forests, agricultural lands, energy and minerals and other natural assets well will be economic leaders in the 21st century. They'll be able to reap the benefits of ecosystem services like coral reefs, which provide food, water purification, tourism and genetic diversity—services valued at $172 billion annually. And they'll be able to invest more in the "intangible" drivers of growth like human skills, education and innovation.

time for citizen action

Mr. President, the message here is clear: Over forty years ago, twenty million Americans—fully one-tenth of our country's population at the time—came together to demand environmental accountability. And they didn't stop there. They elected a Congress that passed the Clean Air Act, Clean Water Act, Safe Drinking Water Act, Endangered Species Act, Marine Mammal Protection Act, Coastal Zone Management Act, and Toxic Substances Control Act. They even created the Environmental Protection Agency—the best example of what our democracy can produce.

We need Congress now to do what the science tells us we have to do, to do what our economists tell us we have to do, to what common sense demands that we do: It's time for Congress to stand up and do its part on climate change.

I don't know how many have read David Orr's terrific book, "Down to the Wire: Confronting Climate Collapse", but it's important for everyone to take the time to understand his argument. Nowhere is the challenge of our moment more clearly expressed: "The real fault line in American politics is not between liberals and conservatives…It is, rather, in how we orient ourselves to the generations to come who will bear the consequences, for better and for worse, of our actions." As Orr reminds us, we're at a tipping point—and it's going to take leadership.

Unfortunately, we are witness to just the opposite.

In a "talking point" memo to his fellow Republicans last summer, House Majority Leader Eric Cantor of Virginia took aim at environmental safeguards as "job killers." He listed the "Top 10 job-destroying regulations," seven of which dealt with reducing air pollution from industrial incinerators, boilers and aging coal-fired power plants.

Job killers? The facts just don't support that.

The Labor Department keeps close tabs on extended mass layoffs, and in 2010, the Department found that of the 1,256,606 mass layoffs, employers attributed just 2,971 to government regulation. That's only about two-tenths of one percent of all layoffs.

In fact, decreasing carbon pollution presents a huge economic opportunity in terms of new jobs and innovation. For every $1 we spend, we get $30 in benefits. The U.S. environmental technology industry in 2008 generated approximately $300 billion in revenues and supported almost 1.7 million jobs. The air pollution sector alone produced $18 billion in revenue.

If we're going to remake the world before 2050, and this is one area where I agree with my Republican friends, we're going to have to harness the power of the good old American

market economy. And one way to do that is to put a price tag on carbon and other global warming pollutants.

With a price tag, we more accurately reflect the consequences of these pollutants, not just for the environment but also for the quality of our lives and the health of our families. If we understand the consequences of our choices, especially in economic terms, we'll make better choices.

One way to do this is to levy a pollution fee that reflects the true environmental cost of coal and oil. But there's no chance the current Congress will enact any tax, especially one on smokestack industries.

Over the course of 2011, the Republican-controlled House held nearly 200 votes to weaken our environmental safeguards, including the bedrock legislation spawned by the very first Earth Day—the Clean Air Act, the Clean Water Act, the Endangered Species Act, even the agency created to enforce those laws, the Environmental Protection Agency.

If we don't use the market, the other option is direct regulation of carbon emissions by the EPA under the Clean Air Act. The conservative-dominated Supreme Court has already given the green light to the EPA to do this. But this invites even more bitterness and political partisanship.

Besides, pricing pollution has already shown itself to be effective. During the 1980s, instead of imposing regulations, we used a cap-and-trade system to reduce the sulfur dioxide emissions from power plants that caused plant- and soil-destroying acid rain. The system included cash incentives to over comply: polluters received allowances for every ton of sulfur oxide under the limits, and they could trade, sell or bank the allowances. The system worked so well that regulated plants reduced emissions 40 percent more than required.

There is every reason to believe some variation of that system would work just as well to curb carbon emissions. But anything related to or resembling "Cap And Trade" isn't the best rallying cry these days thanks to the concerted, cynical rebranding of the concept. But whatever rallying cry is used, the point is the time for action is now. We need a "Million Man-Million Woman-Million Child" March on Washington and the voting booths of America. We need people marching up the steps of the Capitol, pounding on the doors of Congress, demanding a solution to our climate crisis.

shifting to a new global energy paradigm

Deadlines, as we know, are necessary to instill a sense of urgency—and we've got a big one coming up this week at the global Rio +20 Earth Summit.

Much has changed since the first Earth Day Summit back in 1992—and much of it for the worse. True, we're seeing innovation and entrepreneurship flourish in countries that were once considered among the poorest. We should celebrate that. But I'll tell you: Twenty years after Rio, fifteen years after Kyoto, we're further behind than ever. The science is screaming at us. And our planet is sending us a SOS.

Part of the problem is that we failed to implement or be held accountable for the commitments we made twenty years ago. Earlier this month, the United Nations Environment Program issued the official summit report, which noted "significant progress" in only 4 of 90 crucial environmental goals over the past five years. We can—and we must—do better.

I spoke earlier of the need to take advantage of the green energy economy.

Our best economists say that to ward off catastrophic climate change, the green revolution has to happen three times faster than the industrial revolution did. That's why I believe America and the world are facing a moment of truth. Are we going to step up and put in place the policies that will galvanize our green entrepreneurs, drive development of new clean technologies, re-energize our economy, and tackle global climate change—all at the same time?

We invented solar and wind technology, but German and Japanese companies developed it. Today, of the top thirty companies in the world in solar, wind and advanced batteries, only six are based in the United States. If we do this right, I truly believe that the next four or five Googles will emerge in the energy sector. The question is not whether the twenty-first century economy will be a green economy—it has to become one, and it will. The question is whether it happens in time to avert catastrophe, and whether America will continue to lead.

Accelerating the transition to a new energy paradigm is the most important single step the world can take to reduce the threat of climate change. And Rio is as good a place as any to make that happen. At the Summit, nations are expected to announce commitments to the Sustainable Energy for All initiative. Tackling the challenges of energy access, energy efficiency and renewable energy in an integrated way is absolutely essential. That's why a wide variety of stakeholders—from governments to businesses to civil society leaders—have indicated they will be coming to Rio with national action plans in hand that can be monitored over time as part of a new mission of the United Nations and its partners.

I am convinced the countries that take advantage of these opportunities are going to be the leaders of the 21st century. I have already seen successes in Massachusetts. Many of you may not know that Massachusetts was recently ranked first in the nation in energy efficiency and clean energy leadership, edging out California for the first time ever. My state is a great example of the speed in which we can turn ourselves around on this issue. It won't happen overnight, but with serious vision and commitment, we can revolutionize the way we obtain and use energy—and we all need to be working towards that end.

Of course, governments alone can't solve this problem. The private sector is the key. Public-private partnerships like the Global Alliance for Clean Cookstoves can bring together the drive and creativity of for-profit industries with government financial support and encouragement to meet growing energy needs while combating climate change.

transformative change is possible

Bottom line: we Americans need to face up to the climate change challenge—not just as individuals or separate interests, but as a nation with a national purpose. Of course, that's easier said than done when the latest "Trends in American Values" Pew poll shows a 46-point gap between Republicans and Democrats on the need to protect the environment. And I'll give you one guess which party fell by 39 points in its support for protecting the environment since 1992.

Again, I think David Orr is right on the mark: Our challenge is fundamentally political. It's not about budgets. It's not about regulations. It's about leaders in this country who are unwilling to deal with the truth about climate change—leaders that have cowed the silent majority into submission with their contrived and concerted attacks on the facts.

I've spoken before about this country's crisis of governance and the dangers of being held hostage to one party's remarkably cynical and selfish drive for power that comes at the expense of all common sense. Well, what we need today is a transformative moment in our politics.

Let me quote Orr in full here:

"Our situation calls for the transformation of governance and politics in ways that are somewhat comparable to that in U.S. history between the years of 1776 and 1800. In that time Americans forged the case for independence, fought a revolutionary war, crafted a distinctive political philosophy, established an enduring Constitution, created a nation, organized the first modern democratic government, and invented political parties to make the machinery of governance and democracy work tolerably well."

So we have made transformative changes before. And there are other examples. We once burned wood, and then we transitioned to relying on oil and coal. We can make the leap to a mix of renewable energy sources such as hydro, wind and solar. Now we need to set our sights on the next transformation. As the old saying from the 1970s goes, "The Stone Age didn't end because we ran out of stones, and the oil age is not going to end because we run out of oil." Truer words could not be spoken.

In the end, the question is not whether we're going to pay for climate change. We're already paying for it—in warmer temperatures, rising sea levels, melting glaciers, floods, droughts, wildfires, the decimation of animal and plant life, and so much more. The real question is whether we walk a path that addresses it now in a responsible way and that also helps us break humanity's addiction to oil, cleans up our environment and creates jobs—or whether we suffer the consequences later on a massive, unpredictable scale in the form of environmental devastation, war, human misery, famine, poverty, and reduced economic growth for decades to come.

Mr. President: The fork in the road points in two directions. The task ahead of us is to take the one less traveled by. At the height of the American Revolution, Thomas Paine wrote about the "summertime soldiers and sunshine patriots" who abandoned the cause. Well, science has shown that we can't afford to be summertime soldiers anymore.

So, in this time of challenge and opportunity, I hope and pray colleagues commit to transformative change in our politics. I hope we confront the conspiracy of silence head-on and allow complacence to yield to common sense, and narrow interests to bend to the common good. Future generations are counting on us. I yield the floor.