

AN IDEA WHOSE TIME HAD COME:  
AN EXPLORATORY ANALYSIS OF ETHANOL'S RISE TO  
AGENDA PROMINENCE IN THE UNITED STATES

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by Tanya Shinn

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## List of Abbreviations and Acronyms

ADM	Archer Daniels Midland
ACF	Advocacy Coalition Framework
AMATA	Agricultural Market Transition Act
CCA	Clean Air Act
CEO	Chief executive officer
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIA	Central Intelligence Agency
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CONAES	Committee on Nuclear and Alternative Energy Systems
CRS	Congressional Research Service
EESI	Environmental and Energy Study Institute
EIA	Energy Information Administration
EPA	Environmental Protection Agency
EPAct	Energy Policy Act
ERS	Energy Research Service
EWE	Environmental Working Group
GHG	Green House Gas
MTBE	Methyl tertiary butyl ether
NCGA	National Corn Growers Association
NEV	Net Energy Value
NOX	Nitrogen oxides
NRC	National Research Council
OPEC	Organisation of the Petroleum Exporting Countries
RFA	Renewable Fuel Association
RFG	Reformulated Gasoline
RFS	Renewable Fuels Standard
ROR	Renewable Fuel Rule
U.S.	United States Of America
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
VOCs	Volatile organic compounds

## Abstract

This work investigates the question, “what made ethanol’s time come when it did?” The case examined is the Energy Policy Act of 2005 (P.L. 109-158), a landmark public policy law implemented in the United States to address the nation’s energy concerns. The Act’s emphasis on ethanol as a central part of the solution to address the energy crisis represented perhaps the most significant single policy shift in the history of the nation’s energy programme. This research draws attention to the process that resulted in ethanol being given a key role in American energy policy by investigating the pre-decision, agenda setting stage, of the process. Using qualitative research methodologies, this study conducts a historical case study analysis of the Energy Policy Act of 2005. The Multiple Streams agenda setting framework developed by Kingdon ([1984] 1995) is the one which forms the backbone of the study.

This research suggests that the greatest influence on ethanol’s placement on the agenda was the way in which policy problems were constructed. When the energy, agricultural, and environmental problems that had garnered ethanol some legislative consideration in the 1970s and 1980s reemerged in the early 2000s, ethanol emerged as an attractive policy option that was seen as addressing each of these concerns. The role of interest groups and policy entrepreneurs helped to reinforce the relationship between these problems. The tactic of seeking aid from the United States Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) had its advantages, as support from these agencies gave the proposals offered by pro-ethanol interest groups and corn state politicians greater weight. In addition, the fall in political influence of the petroleum industry (a traditionally effective oppositional force to the advance of ethanol) helped to facilitate and reinforce favourable political factors such as pro-ethanol presidential campaign platforms and a public mood that favoured decisive action.

With some small modifications, Kingdon’s agenda setting framework, originally designed and applied in the context of health and transportation, holds up well when extended to the energy policy domain. One key point where the energy agenda setting process appears to diverge from Kingdon’s model occurs in the problem stream, which does not appear to be distinct from the political stream. Instead, this research suggests that problem definition plays a strong role in informing the content of the political stream. Kingdon’s framework has significant potential to enhance our knowledge of alternative energy policy formation.

# CHAPTER 1: INTRODUCTION

“There are two things you never want to see being made—sausage and legislation.”

Otto von Bismarck (1815–1898)

For decades, students of public policy have been fascinated by the question why some issues reach the governmental agenda while others never do. The present study addresses this question by analysing the development of ethanol policy in the United States over the past thirty-five years. The result is a single, historical case study of the agenda setting process that explains ethanol’s rise to agenda prominence prior to the enactment of the Energy Policy Act of 2005 (P.L. 109-158). The Energy Policy Act of 2005 is a worthy case study because it represented a significant shift in U.S. policy that transformed ethanol into an integral part of the nation’s energy legislation.

## 1.1 Ethanol and Agenda Setting

Ethanol policy has become an increasingly important issue in many countries around the world. Although some governments have been promoting ethanol for many years, the real boom began in 2005 and has continued to the present. Since 2005, several countries have chosen to implement policies and launch programs aimed at encouraging the production and use of ethanol.<sup>1</sup> The United States, prominent among the nations that have implemented ethanol-friendly policies, enacted a landmark piece of legislation in 2005 that led to a significant increase in the production and use of ethanol. Signed into law by President Bush on August 8, the Energy Policy Act of 2005 (EPAAct of 2005) contained the nation’s first-ever federal requirement that renewable fuels (mainly ethanol) be mixed into the nation’s gasoline supply. The EPAAct of 2005 aimed to address the multiple problems posed by the energy crisis. The Act’s emphasis on the production of ethanol to combat energy insecurity represented a significant shift in U.S. energy policy history.

The U.S. became the largest producer of ethanol in the world as a result of the EPAAct of 2005. However, the legislation also generated controversy, which in turn fuelled much research on the matter. Entering “ethanol” or “biofuel” into an internet search engine yields a multitude of scholarly articles and technical reports covering every aspect of the issue from policy concerns to environmental costs and benefits, and security issues to production capabilities and predictions. Similarly, the subject has captured the public’s attention, contributing to general discussions on the ethanol topic and the issues that surround it. The attention that has been placed on this issue is not

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<sup>1</sup> Countries that have enacted legislation to promote the use of ethanol in the post-2005 ‘boom’ include the United Kingdom, Thailand, Sweden, Colombia, Costa Rica and India.

entirely surprising given the wide-ranging implications these policy decisions have had on the United States and the rest of the world.

What is surprising, however, is the conspicuous lack of academic attention placed on how ethanol found itself at the forefront of the U.S. government's agenda in the first place. What exactly were the factors that contributed to ethanol's arrival on the political agenda in the United States? If one believes that ethanol was "an idea whose time had come," then what exactly were the factors that contributed to its timely arrival on the U.S. governmental agenda some time prior to 2005? (Kingdon, 1995, 1). Why did ethanol arrive on the agenda just before 2005, and not ten years before or ten years later? If the idea gained momentum because of energy security concerns, why did policymakers focus so heavily on ethanol? And why did this not happen during the 1970s, another period when legislators were preoccupied with energy security?

Conversely, if ethanol's rise to the top of the agenda can be attributed, in part, to environmental concerns or technological advances, then why did some of the literature dispute the fuel and cost efficiency of ethanol while asserting the negative environmental impacts of expanded ethanol production? Who was actively working to promote the development and expansion of the ethanol agenda? What interests did they have in seeing the ethanol agenda expanded? Was the emergence of ethanol on the U.S. governmental agenda a result of a vigorous lobbying and pressure effort from ethanol interest groups and corn-state politicians? Or was ethanol's "agenda status" achieved through rigorous scientific consideration, analysis, and consensus?

Public policies are commonly thought to pass through four stages: (1) agenda setting, (2) policy adoption, (3) policy implementation through legislation or other action, and (4) policy evaluation (Lindblom and Woodhouse, 1993). However, little consideration has been given to how or why ethanol emerged to take such a prominent place on the U.S. governmental agenda. Indeed, the vast majority of the literature has focused on the implementation and evaluation aspects of the EPAct of 2005. While this focus is not surprising, and is certainly well justified given the wide-ranging consequences of the policy, the agenda setting phase of the issue has been largely neglected. With this need for further research in mind, this thesis aims to address the agenda setting phase of the U.S. ethanol policy development process.

In the agenda setting phase, researchers seek to understand how issues are chosen for attention by government, why issues come up when they do, why some issues are acted upon while others are shunned, and who brings up particular issues for government to resolve (Hayes, 1992). How the national agenda is set is one of the most complex and least understood aspects of the policymaking process (Henschen and Sidlow 1989; Kingdon 1995). The lack of academic attention given to the ethanol agenda setting process has resulted in what can only be described as a knowledge gap. This paper addresses this gap by focusing specifically on the agenda setting phase of the ethanol policy development process in the U.S.

The ultimate purpose of this study is to answer the question: what made ethanol's time come when it did? More specifically, this thesis aims to decipher how and why ethanol was able to attain such a prominent place on the U.S. agenda prior to its inclusion in the EAct of 2005. This research investigates how ethanol fared in the agenda setting process by identifying the most important actors and factors that influenced the process, resulting in its insertion as a central component of American federal energy policy in 2005.<sup>2</sup> By investigating the key factors behind ethanol's salience on the policy landscape, this thesis explains why this policy shift was possible.

Although the search for a policy's genesis is futile, it is possible to identify critical factors and moments that turn the tide in favour of new policies or ideas (Birkland 1997, 70). However, determining which factors influence a shift in policy remains a difficult task, and the arena for setting alternative energy policy is as complex as any. The difficulty of this task is compounded further in the absence of a theoretical framework with which to ground the research and help the reader to make sense of the relationships between the variables and factors critical to the rise of ethanol. Indeed, as Schlager (2007, 293) pointed out, "frameworks play a critical role in the culmination of knowledge [as they] bound inquiry and direct the attention of the analyst to critical features of the social and physical landscape." As such, this study employs Kingdon's (1995) "multiple streams" model as the narrative structure with which to describe and explain the ethanol agenda setting process and answer the question posed above.

Drawing upon the "garbage can" model of organisational choice (Cohen, March, and Olsen, 1972), Kingdon's description of the agenda setting process is centred around the idea of streams and policy windows. There are three independent streams or processes: (1) a problem stream, consisting of information about real world problems, (2) a policy stream or community composed of researchers, advocates, and other specialists who formulate possible policy solutions, and (3) a political stream comprised of the public mood, organised political forces, and elections. The possibility of an item's successful inclusion on the agenda is greatest when all three streams come together at a critical moment in time—when problems are coupled with policy solutions at a time when change is politically feasible. This convergence of streams results in what Kingdon terms a "policy window," which he argued represents a fleeting opportunity for an item to gain placement on the governmental agenda.

The multiple streams model was chosen as the theoretical framework with which to explore the ethanol agenda setting process for two important reasons. First, numerous authors suggest that the model provides one of the most accurate descriptions of the agenda setting process (Sabatier 1999; Zahariadis 2007). As such, the model allows a thorough analysis of the issue over the last thirty-five years, enabling a detailed description of the evolution of the process.

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<sup>2</sup> A review of Federal Legislation indicates that ethanol rose and fell from the agenda several times before taking centre stage on the agenda prior to its inclusion as an integral part of the EAct of 2005. Refer to the appendix for a list of the most significant legislation.

The multiple streams model is also a good choice because it has rarely been used to examine the agenda setting process in this particular policy domain. By applying the model to a policy area where it has seldom been used (alternative energy), and to a specific case which is untouched (EPAAct of 2005), this research provides insight into the model's ability to explain agenda setting in a relatively new policy area.

By focusing exclusively on the agenda setting aspect of the policy process, this thesis intends to enhance understanding of how one of the most significant changes in U.S. energy policy history was made possible. However, the true value of this study comes not only from analysing the U.S. experience, but from uncovering important factors that may need consideration in the future as a range of other alternative energy sources are developed. Knowing the variables that may influence a particular energy technology or energy source's likelihood of success in achieving governmental consideration is particularly important in the current era as traditional sources of energy are depleted and consumption continues to increase.

## 1.2 Thesis Outline

This chapter has explained the significance of the U.S. EPAAct of 2005 by highlighting the importance of research that examines how the governmental agenda is set and the key actors and factors that helped ethanol get on the agenda. The chapter also introduced the multiple streams framework that will be used to explore the rise of ethanol, while providing a brief outline of the aims and objectives of the thesis.

The remaining six chapters of this thesis proceed in the following order. Chapter 2, "Literature and Theoretical Framework," first offers a review of some of the more prominent policy making and agenda setting perspectives. The chapter subsequently discusses the multiple streams model used by this thesis, defines several of the terms employed by Kingdon, details the framework's key concepts, and provides an assessment of its strengths and weaknesses.

Chapter 3, "Research Methodology," outlines the objectives and scope of the research. The rationale for the selection of the EPAAct of 2005 as a case study is also discussed. Next, the methods used to gather information are identified, whilst giving justification for their use in accordance with the objectives of the study. The chapter concludes by outlining the research method and discussing the decision to employ a qualitative approach to answer the research question.

Chapter 4, "The Problem Stream," examines the problem dynamics that contributed to ethanol's placement on the U.S. agenda. This chapter traces the evolution of ethanol from being a somewhat fanciful concept to a serious policy option. The chapter details the political and intellectual discussions surrounding ethanol, and the rise and fall of problems that contributed to ethanol being considered a solution. The research takes into consideration the discourse surrounding ethanol three decades prior to the enactment of the EPAAct of 2005. Several important pieces of federal

legislation are also discussed to understand the preoccupations of legislators during the time when ethanol was gaining momentum on the agenda.

Chapter 5, “The Policy Stream,” traces the development of the ethanol ‘idea’ within the policy community. The goal of this chapter is to identify the most important members of the community and examine the influence of their activities on the development and eventual adoption of the ethanol provisions in the EAct of 2005. Chapter 6, “The Political Stream,” examines the political dynamics that contributed to ethanol’s saliency in the U.S. between 2000 and 2005. This chapter also identifies some of the most important “policy entrepreneurs”, significant actors in Kingdon’s model. Identifications are based on the most visible actors, who on many occasions appeared at congressional hearings and discussions when the subject of ethanol was predominant.

Chapter 7, “Ethanol and the Agenda,” is the analytical component of this thesis. This chapter analyses the research presented in chapters four, five, and six to show how factors within each of the streams fit together to answer the original research question. The chapter concludes by providing a brief review of the utility of Kingdon’s model in explaining the agenda setting process leading to the passage of the EAct of 2005. The thesis concludes with suggestions for future research.

## CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

An understanding of agenda formation is central to this study. Kingdon (1995, 3) defined the agenda as “the list of subjects or problems to which governmental officials, and people outside government closely associated with those officials, are paying some serious attention at any given time.” Further, he explained that the “agenda setting process narrows this list of conceivable subjects to the set that actually becomes the focus of attention” (Ibid.). Applying Kingdon’s conception of the agenda setting process to the EPA Act of 2005 case allows for an explanation of how ethanol advanced as a policy issue.

Although this thesis will apply only Kingdon’s multiple streams model, much of his work is based in contemporary agenda setting theory. Therefore, a brief survey of relevant agenda setting literature provides a useful context and clarifies some of the contributions that underlie Kingdon’s work. An understanding of the policy process is also beneficial because agenda setting is recognised in the extensive policy literature as an early phase of the policymaking process. Several of the more prominent decision making models are discussed before undertaking the survey of relevant agenda setting literature, and outlining the multiple streams framework.

### 2.1 The Policy Process

Agenda setting takes place within the policy process. While many different models have attempted to explain this process, one of the oldest approaches to the study of policymaking is the stages approach. The stages approach was the first ‘model’ to analyse policy as a process, that is, as “a set of phenomena organised in time and led by a number of specific and self-induced mechanisms” (Hicks et al. 1995, 8-9). The stages approach separates policymaking into its component stages and analyses each in turn. The stages largely follow the same pattern, varying by degree of specificity and whether or not the process is seen to end with implementation or include further stages, such as evaluation, or termination. Some political scientists have identified as many as nine stages in the process, but the most conventional renderings cite only four. As noted previously these stages include: (1) problem identification and agenda setting, (2) policy adoption, (3) policy implementation, and (4) policy evaluation (Lindblom et al. 1993).

The influence of the stages approach is evident in the work of a number of authors who have continued to refine and elaborate on the concept (Jenkins 1978; Howlett 1995; Anderson 2000). Such ‘staged’ approaches have been useful in reducing the intricacies of the policy process to manageable analytical units, which, in turn, have led to useful stage-focused research on agenda setting (Hicks et al. 1995, 8-9), such as Kingdon’s multiple streams model.

However, stage approaches to the policymaking process have also been subject to much criticism. The main criticisms have focused on the so-called linearity of the model, which fails to account for variations in the policymaking process in the real world and feedback loops (Cobb and Elder, 1984, 394). In practice, “the dividing lines between various activities are artificial and policymakers are unlikely to perform them consciously or in the implied logical order” (Hogwood et al. 2001, 4). Therefore, although policymaking may well proceed in stages, it does not necessarily follow any regular linear pattern (Kingdon 1995, 78).

According to Sabatier (1999), a stages approach also gives the illusion that policymakers arrive at a decision through a rational and systematic approach to problem solving. A rationalist model assumes policymakers make fully informed decisions from a clearly specified set of alternatives in order to achieve goals that have been predetermined. Such a model, according to Kingdon, does not accurately describe the realities of the policy process. The ability of policymakers to process information is more limited than such a comprehensive approach would assume. Legislators are unable to “canvas many alternatives, keep them simultaneously in [their] heads, and compare them systematically” (Kingdon 1995, 77-78).

Further, Kingdon (1995) noted that it is often counterproductive for policymakers to clarify their goals because constructing a political coalition often means persuading people to agree on a specific set of proposals, even though they might not agree on the goals to be achieved. As Sabatier (1999) noted, the policy process, in fact, involves a number of different elements that not only interact with one another, but do so in different ways over time. These elements include actors with different goals, values, interests, perceptions, and policy preferences; large time spans; different programs, involving multiple levels of government; debates and technical disputes; and disputes involving values, money, and authority.

Scholars have generated many alternatives to the rational and systematic description of the policy process. Perhaps the most prominent among these alternatives are the incrementalist and mixed-scanning models. Lindblom (1959) and others developed their description of an incremental approach to policymaking in response to writings implying that “a rational model is or should be used in governmental policy-making” (Kingdon 1995, 79). Rather than considering each issue anew, incrementalism perceives the policymaking process as a series of marginal adjustments to the status-quo. Kingdon (Ibid.) noted that by taking this track, legislators need not “canvass formidable numbers of far-reaching changes, they need not spend inordinate time defining their goals, and the comparisons they make between the current state of affairs and the small adjustments to be made in current behaviour are entirely manageable. The result is that policy changes very gradually, in small steps.”

The mixed-scanning approach, on the other hand, incorporates the rational model and the incremental model in an attempt to draw upon the strengths of both approaches. Basically, a rational approach is taken to setting out alternatives, while an incrementalist approach is used to

choose between the alternatives. However, these models are imperfect descriptions of the policy process. Incrementalism fails to adequately account for policy objectives and does not describe agenda change very well (Kingdon 1995). Mixed-scanning acquires the faults of each model in its attempt to find a compromise between the two.

The Garbage Can model emerged within public choice theory as a critique of rational and neo-rational models of public administration (Cohen, March, and Olsen, 1972). Rather than portray decision-making in public administration as a matter of rational choice, Kingdon (1984) and other theorists in this school have described decision-making as a process characterised by organisational anarchy. For example, Garson asserted that “organizations do not function like computers solving optimisation problems” (2008, 1). Rather, organisations operate like garbage cans into which a mix of problems and possible solutions are poured, and where with the precise mix determines decision outcomes. The mix reflects how many decision areas the organisation handles and how many people have access to the organisation. The mix also reflects the decision load of the organisation, as well as the organisation’s level of resources, time, energy, and attention. The Garbage Can model has been used particularly by students of public sector budget decision-making.

Despite the differences between these approaches, these authors all understand the nature of policymaking as a *process*. This understanding “connotes temporality, an unfolding of actions, events and decisions that may culminate in an authoritative decision” (Schlager 1999, 233). Gertson (1997, 5) described the policymaking process as “dynamic and ongoing...constantly subject to re-evaluation, cessation, expedited, or even erratic movement...in an open environment with neither a beginning nor an end, [and] with virtually no boundaries.” Due to the varying emphases these authors place on the different motivations driving policymaking, they offer different pictures of what motivates policy makers, but they all contribute to a better understanding of policymaking and the various factors involved in this process.

### Agenda Setting

The word ‘agenda’ has many uses in the context of governmental policy. A common distinction is made between the ‘public’ and ‘formal’ agendas. The public agenda refers to the subjects that have attracted a significant degree of public attention, while the formal agenda describes the subjects or issues that the government has officially identified as requiring attention (Cobb et al. 1976). Kingdon (1995) made his distinction between ‘governmental’ agendas—“the list of subjects that are getting attention”—and ‘decision’ agendas—the “list of subjects within the governmental agenda that are up for an active decision” (Ibid. 4). To examine the EPA Act of 2005, this research will use Kingdon’s broad agenda definition: “the list of subjects or problems to which governmental officials, and people outside of government closely associated with those officials, are paying some serious attention at any given time” (Ibid. 3).

The agenda setting process encompasses both problem identification and agenda setting phases of the policy process (Lindblom et al. 1993). While Kingdon (1995) separated the two processes, other authors also incorporated the policy alternative specification as part of the agenda setting process.

Downs (1972) approached agenda setting by focusing on citizen influence, which he traced by means of what he called the “the issue attention cycle.” Using environmental policy as a case-in-point, Downs traced public interest through various stages. He began with the pre-problem phase, the state before an undesirable social condition has engaged public attention. From there, he proceeded to the second phase, which involved broad and intense interest in solving the problem. Phase three included acknowledgment of the costs of developing a solution. The final phase described a decline in enthusiasm for resolving the issue, often as a result of related expenses. Downs’ work, as referenced by a number of public policy scholars, succinctly described the cyclical nature of public attention to policy issues. Recent writers on agenda setting, however, have further developed Downs’ issue-attention cycle, linking it back to political processes, policy subsystems, and the institutional legacy that often remains long after interest in a policy has waned (Kingdon [1984] 1995; Baumgartner and Jones 1993).

Cobb, Ross and Ross (1976) analysed agenda setting as a comparative process. Distinguishing between a public agenda and a formal one, they developed three different models of agenda setting. In the outside initiative model, issues arise in nongovernmental groups and are expanded, first to the public, and then to the formal agenda. In the mobilisation model, issues are initiated inside government and, as a result, end up on the formal agenda more or less automatically. In this case, however, it is often necessary that the issue is also placed on the public agenda in order to mobilise the public. Finally, in the inside initiative model, issues arise in the governmental sphere but supporters do not try to expand them to the public because the initiating groups do not want the issue to appear on the public agenda (Ibid. 127-128). While Cobb, Ross, and Ross’s models provide the most specific categorisation of the type of agenda setting process, they place little emphasis on the internal dynamics of the agenda setting and alternative specification process. In other words, Kingdon’s problem, policy, and politics streams could be applied within any one of the three models.

Cobb and Elder’s *Participation in American Politics: The Dynamics of Agenda Building* is a major contribution to the agenda setting literature. Cobb and Elder speculated that a problem often gains standing on the formal policy agenda only after its proponents engage additional advocates by redefining the issue, usually by substituting one policy image for another (Cobb and Elder, 1983, 44-47). Therefore, opposing groups use language to obtain recognition and mobilise support (Ibid. 56). The process of issue definition enables policy entrepreneurs to attract the attention of new groups by expanding the conflict associated with a particular policy issue or question. Cobb and Elder emphasised that problems are socially constructed and, as a result, have a number of

possible definitions (Ibid. 172-175). Consequently, problem definition often dictates policy because a new image and definition usually requires a new solution or policy alternative.

Unlike Downs, Cobb and Elder did not describe policy formation as a cyclical, political process. Rather, they indicated that at a certain stage in the agenda setting process, policy entrepreneurs are dependent to some extent on the public attention generated by the mass media. Cobb and Elder described the strategic use of symbols to arouse, provoke, and dissuade the public, and to expand conflict and attract new participants, with mass media as the vehicle for dissemination (Ibid. 141-150). Although a point of reference for later theorists (Kingdon, [1984]1995; Baumgartner and Jones 1993), Cobb and Elder did not consider the agenda setting process longitudinally other than in a brief discussion of issue durability (Cobb and Elder, 1983, 158). They did address, albeit briefly, the significance of agenda setting for democratic governance and popular participation. By recognising the role that various groups play in issue expansion (Ibid. 103-108), Cobb and Elder's work reflected the potential for inclusion and public mobilisation as part of democratic politics. Furthermore, they suggested that the study of government from an agenda setting point of view reveals a dynamic relationship between popular participation, social change, and the public policymaking process (Ibid. 162-165).

Sabatier and Jenkins-Smith's Advocacy Coalition Framework (ACF) offers an alternative approach. Developed by the authors in response to inadequacies in the "stages heuristic" or traditional approaches to analysis of the policy process, the ACF deals with the entire policy process rather than just agenda setting. Nevertheless, the ACF enhances understanding of the shifting dimensions and policy-oriented learning across subsystems inherent to complex policy processes. Sabatier and Jenkins-Smith's ACF is a synthesis of previous policy implementation theory. The four main assumptions of ACF are:

1. The process of policy change and learning takes place over time;
2. The most useful way to consider policy change over time is to focus on policy subsystems—that is, on the interaction of those who seek to influence the policy process outcome;
3. Subsystems must include an intergovernmental dimension;
4. Public policies can be conceptualised in the same manner as belief systems, for example, assets of value priorities and causal assumptions about how to realise them (Sabatier and Jenkins-Smith, 1993, 178).

Sabatier and Jenkins-Smith also noted that real world changes, such as a change of administration or evolution of a technology, often alter a situation and result in the redistribution of political resources and alliances among subsystems.

Inspired by biological paradigms, Baumgartner and Jones's (1991, 1993) punctuated equilibrium theory seeks to account for both rapid and incremental policy change—an approach more commonly taken in policy rather than agenda setting models. The model theorises that policy

generally changes only incrementally due to several restraints: (1) the 'stickiness' of institutional cultures, (2) actors' vested interests, and (3) the bounded rationality of individual decision makers (Baumgartner et al. 1993). Stability is 'punctuated' by changes in these conditions, especially changes of administration or changes in public opinion (Ibid.). Therefore, the policy process is characterised by long periods of stability, punctuated by large (though less frequent) changes due to large shifts in society or government.

Punctuated equilibrium theory emphasises the problem identification and agenda setting phases of the policy process, and suggests that interplay between policy image and venues account for times of rapid change. The 'image' of a policy refers to the beliefs and values associated with a policy, and can be gleaned from the terms used to discuss the policy and whether the policy is projected in a positive or negative way (Ibid.) Baumgartner and Jones shifted the focus of agenda setting to these sorts of issues by identifying the common assumption that issues reach the agenda through a process of issue expansion, yet suggesting that the role of policy venue should be considered more carefully. They described a process of "venue shopping" by actors, where venues are selected on the basis of their likelihood to yield results (Ibid.) Punctuated equilibrium theory has many praiseworthy features including, its acknowledgement of the complexity of the policy process, its suitability to the American context, and its emphasis on policy entrepreneurship. As such, punctuated equilibrium theory is useful to advocates and analysts alike, both of whom can better understand the complexity of the policymaking process through this model.

All of the above theories and studies may offer insight into aspects of the ethanol agenda setting process, such as conflict expansion, citizen influence, problem redefinition, the role of public officials, and policy learning. It is the work of Kingdon (1995), however, that will be used to undertake an in-depth examination the formation of the ethanol agenda because agenda setting over a period of time is the main subject of this research. Kingdon's theory appears particularly relevant in the case of the EPA Act of 2005. Kingdon considered a variety of contributing factors to the agenda process, such as presidential attention, the significance of problem definition, policy change over time, interest group pressure, media coverage, and public opinion. Therefore, his theory sustains a longitudinal examination of agenda setting, while enabling a synthesis of the many influences on the process.

Observers have praised the multiple streams framework on a variety of grounds. Some have pointed to Kingdon's work as helping "illuminate the (input-output) systems perspective made famous by Easton (1965)" (McLendon et al. 2008, 34-35). According to Zahariadis (1999) and other proponents, Kingdon's attempt to identify the causal linkages, rather than merely describe relationships, has provided an answer to the lingering question: "How does conversion occur?" Moreover, Kingdon's ideas have influenced the work of some of the contemporary theorists discussed above, including the work of Jenkins-Smith and Sabatier's (1993) ACF, and Baumgartner and Jones's (1991, 1993) punctuated equilibrium theory.

Yet, according to McLendon and Cohen-Vogel (2008, 34), in the initial decade following its original publication, the multiple streams model “attracted relatively little serious analytic examination,” resulting in “the incongruence between the apparent popularity of Kingdon’s ideas and the frequency with which those ideas have been rigorously and systematically limned.” More recently, analysts have applied the framework in the arenas of health care policy, environmental policy (both at the state and national levels) and national-defence policy (e.g. Blaukenau 2001; Durant and Diehl 1989; Kamieniecki 2000; Kavar 1989; Oliver 1991) (McLendon et al. 2008). The multiple streams framework has also been used in studies on policy development cross-nationally (e.g., Peters 1994; Pollack 1997; Zahariadis and Allen 1995) (McLendon et al. 2008, 34). All these studies have generally found the multiple streams model to hold substantial explanatory power (Ibid.).

A growing body of research has also applied the multiple streams framework to various phenomena in the education sectors (Hearn 1993; Larson 2004; McDermott 2005; Mills 2007, Ports 1996; Protopsaltis 2004) (McLendon et al. 2008). According to McLendon and Cohen-Vogel (2008, 34), “in the main, these studies have tended to find support for the Multiple Streams framework, even when competing explanations of agenda formation are considered” (McLendon et al. 2008).

However, the greatest problem with the multiple streams framework remains the “lack of systematic research addressing the model’s external validity” (Ibid. 34). As indicated by the review of studies above, the analytical treatments have only been applied to a rather narrow range of policy questions. This thesis aims to build on the work of previous analysts by applying the multiple streams framework to the case of the EAct of 2005. The framework does not yet appear to have been critically applied to energy policy, and the EAct of 2005 is a case that has thus far been neglected. Through this investigation of the ethanol agenda formation, this research aims to contribute to the body of systematic research by assessing the model’s applicability to the energy policy domain.

## 2.2 Theoretical Framework

Kingdon authored several books on agenda setting and the public policy process. In *Agendas, Alternatives and Public Policies* ([1984] 1995) he constructed his unique multiple streams approach. The key question Kingdon’s model seeks to address is: Why do some issues or problems become prominent on the governmental agenda while others do not? The phrase “an idea whose time has come” is argued by Kingdon to capture the fundamental reality of the process by which some ideas come to be seriously considered by policymakers (Ibid 1). The model focuses on the flow and timing of policy action rather than on its component steps, underlining the existence of three distinct but complementary processes or streams in agenda setting. Kingdon suggested that a window of opportunity opens when the streams come together at critical moments in time: a

problem is recognised, a solution is available, and the political conditions make certain proposals more likely to be adopted (Ibid. 168-169). The greatest agenda change takes place when the streams are coupled together by policy entrepreneurs during a window of opportunity (Ibid. 87).

### Key Terms and Definitions

This section will clarify some of the key concepts and terms utilised by the multiple streams model. Contrary to some of the literature, which makes no distinction between the ‘public’ and ‘formal’ agenda, Kingdon drew a clear line between these two concepts. As previously noted, he termed the public agenda, the governmental agenda, or “the list of subjects that are getting attention” (Kingdon 1995, 4). This is distinct from the formal agenda, which Kingdon termed the decision agenda, or “the list of subjects within the governmental agenda that are up for active decision” (Ibid.).

Kingdon also distinguished between the agenda setting and the “generation of policy alternatives,” or solutions. He defined the agenda as “the list of subjects or problems to which governmental officials and people closely associated with those officials are paying some serious attention at any given time” (Ibid, 3). Alternatives refer to the “list of proposals or policies for government action that are seriously considered by governmental officials and those closely associated with them” (Ibid. 4). Agenda setting may change suddenly, but the solutions evolve incrementally over time. Therefore, agenda setting is more related to governmental agendas because it exists independently from a specific solution. Alternative specification eventually leads to the natural selection of a shorter list of solutions to address the agenda item that results in the decisional agenda.

### The Multiple Streams Framework

Kingdon’s model depicted the presence of three major process streams: a problem stream, a policy stream, and a political stream. Each stream is largely independent of the others and develops according to its own dynamics and rules. The first stream—the problem stream—embodies the issue of concern itself. According to Kingdon, policy makers come to identify particular societal conditions as problems by way of three major mechanisms: indicators, focusing events, and feedback (Ibid. 87). Firstly, indicators may be used to assess “the existence and magnitude of a condition,” which in turn might be interpreted by policy makers as evidence of a problem (Ibid. 90). Examples of indicators include such things as highway deaths, disease rates, costs of entitlement programs, and infant mortality rates.

Secondly, focusing events, in the form of crises or disasters, can also capture the attention of policy makers. However, these focusing events generally need to be accompanied by a pre-existing awareness of the problem, early warning, or in conjunction with other events that highlight the problem. A systemic agenda item may be advanced by becoming attached to a focusing event in

order to reach the governmental agenda. Indeed, Kingdon suggested that the focusing event may provide the “little push” needed to focus attention on a problematic condition (Ibid. 94).

The third mechanism through which problems are brought to the attention of government officials is feedback. Feedback can be either formal or informal, and is broadly understood as the information that is ‘fed back’ to decision makers regarding the operation of existing programs (Ibid.). Feedback may result from such sources as programme evaluation studies, systemic monitoring, bureaucratic awareness, complaints from citizens, public deliberation, and the media (Ibid. 100-101).

The second stream—the policy stream—describes potential alternative solutions to problems. Alternatives are an essential part of the agenda setting process because a viable alternative or solution must be available before an issue can attain a position on the decision agenda (Kingdon 1995, 16-18). For Kingdon, alternatives are generated by the policy community, which is composed of experts and specialists within a given policy domain. The list of these specialists can be very long, and may include actors from both inside and outside of government: academics, scientists, government agencies, career bureaucrats, and interests groups (Ibid. 200-201).

Kingdon compared the selection of an alternative solution or proposal in response to a problem to a process similar to that of biological natural selection (Ibid. 116). Metaphorically, he compared the policy stream to the “primeval soup” (Ibid.). The policy community pours solutions into the soup. These ideas then float around, and are continually revised and combined in this primeval soup. Only proposals that meet certain criteria survive to be of serious consideration.

Kingdon’s criteria for the acceptance of solutions are technical feasibility and congruence with the values of the policy community, which he terms value acceptability. The technical feasibility of an idea may be reliant on aspects of the idea, such as its budgetary impacts, but is more often concerned with whether the idea will provide a solution to the problem. Value acceptability refers to the compatibility of a solution with the values of the members of the policy community (Ibid. 133.). Other criteria include the anticipation of future constraints (for example, budgetary limits), and receptivity by politicians and the public.

Policy entrepreneurs are also crucial to the survival of an idea. They work to open up policy communities so that an alternative may gain acceptability amongst the members. A list of alternatives available to the governing agenda results from the processes described. Ultimately, however, Kingdon asserted that it is the idea or solution itself, and not the pressure exerted by these advocates, that ensures the survival of ideas (Ibid. 144).

Kingdon’s third and final stream is the political stream. This stream is independent from the other two streams and operates according to its own dynamic and rules. The political stream encompasses the political factors that influence agendas, such as swings in the national mood, elections, changes of administration, and what Kingdon termed “organised political forces,” which refers to the voices or campaign tactics of advocacy and opposition groups (Ibid. 146-159). Each of

these elements may act as an impetus or constraint for the success of an idea receiving serious consideration.

A shift in national mood reflects changes in public opinion or broad social movements (Ibid.). The potency of this element of the political stream, however, is dependent on policymakers' ability to sense the shifts in the national mood as they occur. According to Kingdon, policymakers' perception of the national mood does not necessarily reside in the mass public. Rather, their perceptions are informed by communications via mail, trips home, newspaper coverage, opinion polls, and conversations with constituents (Ibid. 163).

The more cohesively organised political forces or interest groups act, the more they are able to influence the agenda. According to Kingdon this is because politicians like the idea of the "bandwagon" (Ibid). The absence or presence of constituency also plays a role in either adopting or changing policy in this process of consensus building. Consensus building in the political stream occurs through bargaining. This is in contrast to the policy stream where consensus takes place through persuasion (Ibid. 159-161).

The political stream is also characterised by events such as election campaigns and tactics, election results, turnover of key personnel or shifts in the jurisdictional boundaries of government officials, all of which influence what issues are prominent on the agenda. Of the elements listed above, Kingdon suggested that the combination of national mood and turnover in government exerts the most powerful effect on the government's policy agenda (Ibid. 164).

Each of the three streams is separate and independent and develops according to its own dynamic and pace. As such, no stream is by itself decisive to the overall policy process, though each of the streams is important. The key feature of the process occurs when the streams temporarily come together. Issues gain prominence on the agenda when at least two, but ideally three, of the streams converge at critical moments in time. Kingdon labelled these moments "policy windows" and defined them as "fleeting opportunities for advocates of proposals to push their pet solutions, or to push attention to their special problems" (Ibid. 165). A favourable change in the political stream, or the emergence of a problem that captures the attention of policy makers may open a policy window. However, the temporary nature of the policy windows means that they often close as unpredictably as they open.

Policy entrepreneurs are highly knowledgeable and committed individuals located either inside or outside of government. They are willing to "invest time, energy, reputation and money to promote a position for anticipated future gain in the form of material, purposive or soldiery benefits" (Ibid. 179). In addition to resources, effective policy entrepreneurs have access to legislators and possess negotiation skills that enable them to skilfully attach problems to their preferred policy solutions and find policy makers who are amenable to their ideas (Zahariadis 2007, 74).

Policy entrepreneurs are encountered at three junctures in the agenda setting process: (1) pushing their concerns about certain problems higher on the agenda, (2) pushing certain solutions or policies during a process of softening up the system, and (3) making the couplings between the streams during the windows of opportunity. The ways in which policy entrepreneurs link particular problems, policies, and political conditions vary greatly due to the loosely coupled nature of problems and solutions (McLendon et al. 2008, 33). However, the chance of an item reaching the decision agenda is enhanced when problems and politics interact, and when they are coupled with policy to produce a single package acceptable to policy makers (Zahariadis 2007, 74)

### Strengths and Weaknesses of the Framework

The application of theory is central to any social science. Models are important in political science, as they allow hypotheses to be tested and questions to be answered, and provide a simple manageable method for representing complex phenomena. Agenda setting theories provide generalisations that aid in the explanation of behaviours and events influencing the process. However, agenda setting theories are not perfect; each model has its own unique set of limitations. Therefore, an accurate assessment of the strengths and weaknesses of the multiple streams model is necessary before examining the ethanol case.

A key strength of the multiple streams model is its recognition of the policy process as fluid, non-linear, and, at times, chaotic. The model presents the agenda setting process as the collective output formulated by the push and pull of a variety of factors (Zahariadis 2007, 66). Indeed, the literature review above highlighted the importance of using a model that would allow for analysis of the multiple influences at work in ethanol's ascent to the agenda. The model helps bring order to the complexity of the process through the idea of temporal sorting, and provides a flexible model for analysis of policy that is born out of ambiguity and uncertainty (Ibid.). The model does not assume that governments always take a comprehensively rational approach to decision making while still acknowledging the role of ideas and information in the process. This aspect of the model is particularly appealing in the case of the EAct of 2005 because of the huge volume of competing scientific and technical information on ethanol. Indeed, complete knowledge of all aspects of the ethanol issue would appear to have been impossible for most policymakers in this context. Sabatier (1999) also observed that the model allows the research to get beyond the rigid institutionalism in which many political scientists confine themselves. Overall, the multiple streams model allows for an exploration of the EAct of 2005 that accommodates numerous things happening at once.

The model is based on empirical studies of what happens in federal policy in the United States. However, the model may also prove useful in contexts outside of the U.S. because it can capture the confusing nature of politics and collective decision making. For example, in a report prepared for the U.S. Agency for International Development, Hicks and Porter (1995) determined that the

model was particularly appealing in its application to assessing African policy realities. Canadian researcher Michael Howlett (1998) made a similar assessment of the multiple streams model, concluding that the types of policy windows identified by the model are also valid in the Canadian context. The conclusions of these authors suggest that the research findings of this thesis may have some application outside of its U.S. context.

The multiple streams model has not been without criticism despite its significant contributions to understanding the agenda setting process. An often-cited criticism of the framework is that it places too much influence on the independence of the streams (McLendon et al. 2008; Sabatier 2007; Zahariadis 1999). For example, Mucciaroni (1992, 473) asserted that the model's emphasis on the independence of problems, policies, and politics is "too indeterminate and cloud-like". Further, Mucciaroni suggested that "those items that reach the agenda are precisely those that exhibit (or have the potential of exhibiting) stronger linkages and greater congruence among the streams" (Ibid.). In addition, McLendon and Cohen-Vogel (2008) argued that because the multiple streams model neglects the linkages between the streams, it may result in a level of specification that is too general.

Yet researchers continue to acknowledge the model as an effective tool for examining the policy process. Indeed, Zahariadis (1999) identified the multiple streams model as providing one of the most accurate descriptions of the policy process. Mucciaroni further emphasised this point stating: "these shortcomings do not diminish the strengths of the model. It captures much of the complexity, fluidity, and unpredictability of agenda-setting and highlights the important role of chance, innovation, and human agency in policy making" (Mucciaroni 1992, 482).

## CHAPTER 3: RESEARCH METHODOLOGY

The previous two chapters of this thesis have introduced the research topic, outlined its purpose, discussed key pieces of research in the policy making and agenda setting literature, and identified the framework that will be used to explore ethanol's rise to agenda prominence. Here, the focus of the thesis will turn to the research methodology. This chapter will begin by detailing the objectives and scope of the research, and explaining the rationale for choosing the EPOA of 2005 as a case study. Next, the chapter discusses the methods used for gathering information on the case, whilst giving justification for the use of these methods in accordance with the objectives of the study. The chapter concludes by discussing the decision to employ qualitative approach to answer the research question, and outlining the research method.

### 3.1 Research Objective

A clear understanding of the aim of the research is crucial prior to undertaking any research endeavour. The primary objective of this study is to answer the question: what made ethanol's time come when it did? More specifically, this thesis seeks to decipher how and why ethanol was able to attain such a prominent place on the U.S. agenda prior to its inclusion in a number of provisions in the EPOA of 2005.

Based upon Kingdon's multiple streams model, this investigation of the ethanol agenda setting process seeks to identify the most important actors and factors that influenced its transformation from a series of fringe policies in the 1970s, 80s, and 90s, to being included as a central component of American federal energy policy in 2005. By investigating the key factors behind ethanol's saliency during this period, this thesis examines why it achieved such a prominent place on the agenda.

The true value of this study comes from applying what has been learnt from past academic efforts to explain the processes at work when setting the agenda, and applying these lessons to the relatively new energy policy domain of ethanol. By applying an established agenda setting model, such as Kingdon's, to the relatively new area of public policy, this research uncovers important factors that will need consideration in the future as a range of other alternative sources of energy (renewable or otherwise) continue to be developed. Knowing the variables that may influence a particular energy technology or energy source's likelihood of success in achieving governmental consideration is particularly important in the current era as traditional sources of energy are depleted, consumption continues to increase, and reliance on some sources of energy (such as coal and oil) come to be regarded as unfavourable.

## 3.2 Research Scope

This thesis provides an assessment of ethanol's rise to the agenda, identifies the key actors and variables involved in its ascent, and provides a review of Kingdon's multiple streams model to account for ethanol's rise to the agenda. However, this thesis is not a critical assessment of the merits of the ethanol provisions implemented in the EAct of 2005, nor does it offer an assessment of ethanol's general utility. Moreover, the research does not concern itself with whether the policies and programs had their intended effect, nor does it evaluate the impact of ethanol's expanded production and use since the enactment of the EAct of 2005.

Due to the vast volume of literature produced on ethanol and related topics prior to the implementation of the EAct of 2005, a comprehensive review of all input from specialised communities within the policy stream is beyond the scope of this research. However, this thesis does identify some of the most visible actors within the policy stream as well as the influential scientific studies on ethanol and research produced within the specialised communities that ultimately had an effect on the policy process. Assessments of the relative influence and prominence of these pieces of research are based upon the number of references made to them, or their authors, by important people in and around government.

Although this is an imperfect method of gauging the influence of particular pieces of research on ethanol's rise to agenda prominence, it does allow the most visible members of the community to be identified. In order to identify what Kingdon refers to as the "invisible" members of the community and gain a more accurate account of the influence that these actors may have had on the agenda setting process, a series of interviews would have been necessary. In this case, however, resource constraints relegated interviews beyond the scope of this thesis.

## 3.3 The Case

The multiple streams lens is employed here to examine the ethanol agenda-building process. The choice of the EAct of 2005 case is not an arbitrary selection, but was made for several important reasons.

First, the EAct of 2005 is one of the most significant U.S. energy policy changes in recent times at the federal level. A landmark piece of legislation that is widely credited with having "kick-started" the ethanol industry, the EAct of 2005 solidified ethanol as an important component of U.S. energy policy (EESI 2006; Duffield and Collins 2006). The Act contained a host of provisions aimed at significantly increasing the production and use of ethanol. In particular, it mandated a renewable fuel phase-in called the "Renewable Fuels Standard" (RFS). The RFS required U.S. fuel production to include a minimum amount of renewable fuel, most of which was to be met with ethanol, beginning at four billion gallons in 2006 and reaching 7.5 billion gallons in 2012, after which the use of the fuel was required to grow by at least the same rate as gasoline production

(Duffield, Xiarchos and Halbrook 2008, 10). The RFS provision also eliminated the Clean Air Act (1990) requirement for reformulated gasoline to contain two percent oxygen, and establish a credit trading system.

Other significant provisions enacted by the EPO Act of 2005 included the Cellulosic Biomass Program, which was created to encourage the production of cellulosic or “second generation” ethanol. Among other things, the program required the applicable volume of renewable fuels under the RFS to include a minimum of 250 million gallons of fuel to be derived from cellulosic biomass, such as switchgrass, crop residues, and tree crops, beginning in 2013 (Ibid.). However, the technology for converting this type of biomass into cellulosic ethanol had not, and still has not, been fully developed (Ibid.). As such, a range of provisions were adopted to promote research and development into conversion technology that could take advantage of less expensive crops and expand the resource base for ethanol production (Ibid.).

Second, the EPO Act of 2005 is an attractive case to examine because it exhibited the kind of irregularity and innovation that Mucciaroni (1992, 463) suggests mark the “cloud-like features of political affairs.” Indeed, this piece of legislation appeared to go against much of the wisdom concerning U.S. politics. For instance, the Act is not the expected outcome of a political system usually depicted as one in which effective leadership is scarce, and where building consensus in favour of fundamental policy change is made increasingly difficult under a system of divided government (Ibid.). In short, the EPO Act of 2005 case shows how “generalisations about political phenomena are highly mutable and often decay quickly” (Ibid.).

Third, the rationale for case selection is partially based on Kingdon’s argument that the multiple streams model “is superior to its leading rival—incrementalism—precisely because it explains non-incremental policy change, which he finds characterises many of the cases he observes” (Ibid. 463). The implementation of the EPO Act of 2005, was if anything, a non-incremental change for ethanol, and should therefore be explained well by the multiple streams model.

Fourth, this research reflects a personal interest in ethanol and the dynamics involved in its emergence on the U.S. agenda. This interest comes from a desire to understand why after thirty years of relative obscurity in the U.S., ethanol was able to make the transition to become a significant component of the nation’s energy policy. It is an interesting case with which to apply a theoretical lens in order to enhance our understanding of the processes involved in its rise to agenda status before its implementation in the EPO Act of 2005. This would allow many of the intricacies in what was a remarkable transformation to be explained, and factors that contributed to the high degree of consideration by decision-makers to be identified. However, the job here is not only to explain the intricacies of the ethanol story itself, but also to provide insight into the ability of the agenda setting model outlined by Kingdon to account for this.

Finally, much of the literature has thus far concentrated on the implementation and evaluation phases of the EPO Act of 2005 case (Duffield et al. 2008; Khanna 2008). While the use of this type

of literature is useful in explaining both the current boom ethanol is enjoying and the impacts of the legislation, the literature does not account for how ethanol got into a position for enactment in the first place.

The small numbers of authors who have given some consideration to the question of how ethanol came to be placed on the agenda, have done so only fleetingly. For example, some authors have highlighted the problems that existed within the system, such as energy shortages and events such as the September 11 terrorist attacks, as motivation for a shift in ideology toward increased production and use of domestic sources of energy such as ethanol (Tyner 2008). Other authors have emphasised the role of interest groups as explanation for the host of ethanol-friendly provisions included in the EAct of 2005 (Johnson et al. 2000). However, individually, these authors do not consider the dynamic and holistic nature of the agenda setting process. For instance, an interest group explanation cannot account for why ethanol's powerful competitors (such as petroleum manufacturers and distributors) were unable to block the passage of the provisions included in the EAct of 2005. Similarly, ideology as a sole explanation is limited. After all, how can the U.S.'s acceptance of significant government intervention in the nation's energy policy be explained in light of general distrust of other forms of governmental intervention such as national health insurance? Therefore, given the deficit of current literature on this topic, a more thorough explanation of the complex dynamics involved in ethanol's arrival on the agenda before its inclusion in the EAct of 2005 is necessary.

### 3.4 Data Collection

The information used within this thesis was collected from both primary and secondary sources of documentation. Primary sources of data included congressional hearings and discussions as well as a range of specialised reports and other documents published by federal agencies such as the U.S. Department of Energy, the U.S. Department of Agriculture, and the Environmental Protection Agency. Also included are Congressional Research Service reports that addressed the topics of renewable energy, agriculture, the environment, and natural resources. Other primary sources include specialised articles and data published by various educational institutions, media reports, records of personal communications, and conference material.

The particularly strong use of primary sources of information within this thesis allowed determinations to be made about the political, social, and institutional contexts leading to the enactment of the EAct of 2005. Reviews of congressional hearings and discussions were particularly useful in enabling identifications of the most visible actors in the debates related to ethanol and the EAct of 2005. Analyses of these hearings and discussions also allowed any shifts in the positions, or developments in the arguments of these actors to be identified.

A variety of secondary source materials stand in for the years that congressional hearing reports or records of congressional discussions were unavailable. Consulting a wide range of

documentation was necessary to ensure the reliability of these sources. This range provided balance and allowed for the triangulation of references and ideas. Secondary sources of information included journal and magazine articles, books, credible internet sources, special interest group publications, and academic papers.

### 3.5 Qualitative Research

This thesis has been designed to foster a greater understanding about the U.S. ethanol agenda setting process. Given the deficit of current literature on this topic, this thesis uses qualitative research methods to enhance the understanding of how and why the ethanol idea gained momentum.

The decision to employ a qualitative research methodology was based upon its usefulness in studies where little is known about the topic and where insight, rather than generalisation, is sought (Davidson and Tolich, 2003). Qualitative research enables analysis to be approached holistically and contextually, rather than being reductionist and isolationist (Ibid.). The fact that the method is unconstrained by a set of predetermined variables means that research efforts can be concentrated on gaining a full, multi-dimensional picture of the ethanol case, thus allowing the problems of oversimplification, misunderstanding or accommodation, which can often occur through quantitative analysis, to be avoided. Therefore, a clearer understanding of the motives, actions, and rationality behind ethanol's salience can be gained through qualitative analysis.

Despite the positive aspect of the approach, however, qualitative research is often criticised for its lack of rigour, raising questions about the validity of results. To build confidence in qualitative inquiry and overcome problems of validity, King, Koehane and Verba (1994) suggested a systematic and transparent approach to analysis. To achieve the type of approach that defines "good" qualitative research, King et al. (1994) identified three essential elements: (1) transparency of research procedures, (2) multiple sources of data collection, and (3) replicable analysis.

As to transparency of research procedures, a great deal of care has been taken to ensure a comprehensive record of the methods by which data was collected. Moreover, the processes by which decisions were made, and conclusions drawn, are made evident throughout the paper. By ensuring the transparency of research procedures used within this thesis, readers are able to make their own assessments about whether the research has been carried out to a high standard and with an appropriate level of justification for the decisions that have been made.

As to replicable analysis, King et al. (1994) admitted that this is a difficult task to achieve within qualitative research. However, by making the raw data available to readers the researcher allows them to decide for themselves if the analysis is an accurate representation of the data. As such, quotations have been used extensively throughout this research so that readers may see for themselves how conclusions were drawn.

The final requirement of qualitative research validity is that data is collected from multiple sources. As previously noted, the information used within this thesis has been collected from a range of sources, including congressional hearings and discussions, books, credible internet sources, special interest group publications, and academic papers. This range of data allows the information to be cross-checked and regularities in the data to be identified.

### 3.6 Method

The method of research is that of a single, historical case study of the EAct of 2005 used to examine ethanol's rise to agenda status. Despite criticisms of single case studies, Yin (1989, 47) suggested that selecting a single case is justified when the case represents the application of a significant theory. Kingdon's multiple streams model of the agenda setting process is well established among policymakers and is widely regarded as enabling researchers to present the fluid agenda setting process in a largely understandable way (Zahariadis 1999; Blankenau 2001). Furthermore, Yin (1989) suggested that a researcher use a case study (single or otherwise) when it is desirable to cover contextual conditions that are highly pertinent to the study. This research takes Yin's (1989) perspective, as the complexities of the contextual situation in the U.S. were of critical importance in determining the reasons why ethanol was placed on the agenda at the particular time under examination.

To understand why ethanol gained such a prominent place on the agenda prior to its inclusion in the EAct of 2005, the research is broken-down into three parts along the lines of Kingdon's multiple streams. First, the problem stream was examined to show how some social conditions came to be recognised as problematic. Second, the policy stream was examined to gain a more accurate picture of the key members of the ethanol policy community and their influence on the development of the ethanol alternative. Third, the political stream was explored to determine if the political conditions were favourable to the idea of ethanol and to identify the most important policy entrepreneurs involved in the agenda setting process.

The problems that contributed to ethanol's placement on the agenda were identified using the mechanisms suggested by Kingdon's framework, which examined systemic indicators, formal and informal feedback, and focusing events. From examining these factors over a period of three and a half decades, it has been determined that the re-emergence and development in understanding the relationship between agricultural economic, environmental, and energy problems opened the window of opportunity for ethanol. However, factors within the policy stream played an important role in determining the viability of the idea once the window had opened. The investigation of the policy stream traced the development of the ethanol idea within the policy community from 1970 to 2005. By examining the different actors and their activities across time, determinations have been made about the relative influences they had on the ideas' survival and subsequent policy success when the window of opportunity opened.

The examination of political conditions followed a slightly different structure than the preceding two chapters. Rather than covering the political conditions from the 1970 to 1990 period, the focus was placed on 2000 to 2005. This was primarily because many of the political factors and their influence on the agenda setting process (during 1970 to 1990) are considered in the examination of the problem stream. While this may not be ideal considering Kingdon's emphasis on the independence of the streams, this approach allowed instances when ethanol was able to gain some attention from legislators to be identified and several pieces of early ethanol legislation to be discussed.

Therefore, in lieu of the need to re-examine political factors during 1970 to 1990, the examination of the political stream uses the mechanisms identified by Kingdon to determine the presence of a favourable political climate from 2000 to 2005 specifically. The factors considered include national mood, organised political forces, and elections. Identifications of ethanol's policy entrepreneurs are also made at the conclusion of the chapter. However, their activities in relation to the promotion of ethanol are evident throughout the preceding two chapters.

## CHAPTER 4: THE PROBLEM STREAM

Kingdon (1995, 90) describes the problem stream as being among the most important in terms of the influence it exerts on the agenda. It is within this stream that some social conditions are recognised as problems by policymakers. Deciphering precisely how certain social conditions come to be identified as problems while others are ignored is a complex proposition. However, Kingdon (1995) suggests that problems capture the attention of governmental decision makers through several mechanisms, including systemic indicators, formal or informal feedback, and focusing events.

Using such mechanisms, this chapter traces the evolution of energy, environmental, and agricultural conditions that came to be identified as important problems by policymakers. In addition, the role that these factors played in increasing the consideration of ethanol as a potential source of alternative and renewable energy during the 1970s to the 1990s will be discussed. Special attention is given to the period from 1990 to 2005, during which time policymakers recognised the relationship between the problems related to energy security, environmental degradation, and agricultural economic decline.

### 4.1 Problems of the 1970s

The OPEC oil embargo of 1973 clearly constitutes the type of focusing event Kingdon refers to (1995). While, in hindsight, the motivation for OPEC's actions appears to have been building for some time, the resulting oil shortage nevertheless had a severe impact on the U.S. One of the most immediate impacts was the quadrupling of the price of oil by 1974 to nearly US\$12 per barrel (CBC News, 2007). This increase affected many sectors of the U.S economy as businesses passed their increased costs on to customers. However, the most obvious indication that there was a problem were the long lines at service stations as people lined up to fill their vehicles from the limited supplies. The enormity of the problem that had been revealed in the wake of the oil crisis was addressed in several newspaper articles (O'Brien 1973; Greer 1973). The prevailing perception is articulated in the lead sentence of an article published in the Washington Post: "Endemic and incurable are strong words, but strong as they are they only begin to describe the depth of the energy crisis in the United States" (O'Toole, 1973).

The importance of the 1973 oil embargo as a *rationale* and *trigger* for policy change was also highlighted in several news articles (Anderson 1974; O'Toole 1974; Marder 1974). Among these is the November 1973 cover of Time, headlined "The Arab's new oil squeeze: Dim outs, Slowdowns, Chills". The article went on to state that: "Even if the Arabs were to open their taps tomorrow, the world would never again be the same. The sudden shortage of fuel has finally jolted government into a realisation that the era of cheap and ample fuel is dead" (Time, 1973). Additionally, in his

nationally televised 1974 State of the Union address, then-President Richard Nixon declared the era to be “the first in which the one priority, the first priority, is energy” (Hakes 2008, 32). Similarly, in his first address to Congress, newly elected President Gerald Ford vowed that he would push for ‘Project Independence’ (Ibid. 36).

While the events of 1973 provided the impetus for change, the threat of reliance on foreign oil imports was already well established (Ibid.). The events of 1973 merely threw open the window of opportunity for policy change. Indeed, the high degree of congressional attention paid to energy is demonstrated by a number of policies enacted in the wake of the crisis. The aim of most of these policies was to reduce U.S. reliance on foreign sources of ‘insecure’ oil through conservation and greater reliance on domestic sources of energy (including energy produced from agricultural sources) (Duffield et al. 2006). The first piece of legislation that considered ethanol as an alternative source of energy was the *National Energy Policy Conservation Act* in 1975. The dual aims of this law were to address the issue of energy security (which had now become a matter of national security in the wake of the oil crisis) and to phase out leaded gasoline (which had become a problem in its own right). Thus, in an effort to examine alternative sources of energy and mitigate the adverse health effects created by lead, methyl tertiary butyl ether (MTBE) and ethanol came under consideration for the first time by Congress.

In the early days of his presidency, Jimmy Carter indicated that he intended to take drastic steps towards producing “a comprehensive long-range energy policy” (Hakes 2008, 45). The priority agenda position that energy then occupied in the U.S. is evidenced further by Carter’s ‘Moral Equivalent of War’ speech. In that speech, Carter emphasised the growing energy dependency problem, indicating that strong measures were potentially necessary in order to avoid a major catastrophe (Carter, 1977). Feedback, in the form of a study conducted by the Central Intelligence Agency (CIA) and released by the White House, also appears to have influenced this opinion. The findings of the CIA study were pessimistic as regards to the future of oil supplies, and predicted a sharp reduction in Soviet oil production within several years. The report also indicated that while new supplies of oil from places such as Alaska would help in the short-term, additional sources of oil were limited. The only major option was thought to be Saudi Arabia, which the CIA reported to have the potential to double its capacity, offsetting growing demand through the 1980s. However, the CIA cast some doubt on whether “the Saudis [would] be able, or willing, to do so” (CIA, 1977).

The newly formed Department of Energy (USDOE) also provided feedback on the ever-progressing energy problem, highlighting the vulnerability the U.S. faced through its increased dependency on foreign oil (Kraft et al. 1984, 320-326). Numerous energy policy studies were also conducted in the 1970s. These studies generally prescribed greater use of nonconventional sources of energy to reduce U.S. reliance on imported oil, and to limit environmental and public health

risks posed by the use of fossil and nuclear energy (Zinberg 1983; CONAES/NRC 1980; Stobaugh et al. 1983).

The crisis of the 1970s and the pressure to formulate a national energy policy pushed policy makers towards considering alternative sources of fuel, one of which was ethanol. Carter's advocacy for the 'new' ethanol idea as part of his comprehensive energy plan is evidence of this consideration. In one of his televised speeches to the nation, Carter advocated the use of alcohol-blended fuels for the purposes of "running cars and other vehicles" (Hakes 2008, 46-47). Carter also proposed a four-cent tax credit for a gallon of "gasohol", a mix of 90 per cent gasoline and 10 per cent alcohol (Ibid.). With this formulation, each gallon of pure alcohol would yield a 40-cent tax credit after blending. Carter justified the subsidy on the basis that ethanol could run traditional vehicles, utilise American grains, and displace foreign oil (Ibid.).

The subsequent passage of the final version of the *National Energy Act* of 1978 reflected the consideration accorded to alternative and renewable sources of fuel in the wake of the oil crisis. Indeed, the 1978 *Energy Tax Act*, which developed as part of the *National Energy Act*, included a federal subsidy for ethanol producers at the levels proposed by Carter. Reactions to the tax breaks provided to ethanol during this period were largely positive. A good indication of the positive reception is the praise accorded to the Act by Senator Robert Morgan from North Carolina, who stated that it would allow the U.S. to "grow our oil after the Arab sands went dry" (Ibid. 52).

However, the reprieve that policymakers might have expected from the successful passage of legislation aimed at addressing U.S. dependence on foreign energy was short-lived. A second set of focusing events in the late 1970s once again put the issue at the forefront of policymakers' minds. The 1979 (or second) oil crisis was, in part, created by a combination of two critical situations. The 1979 Iranian Revolution and the commencement of the Iran-Iraq war in late 1979 severely curtailed oil production. The ensuing natural gas shortages also prompted energy to become a focal point for government.

A variety of newspaper articles focused on the energy issue when gasoline queues began reappearing across the country (Burchard 1979; Berry 1979). Most of these articles reinforced themes about the need to find alternative supplies of energy. This increased focus on the issue in the country's media was articulated by the lead sentence of an article in the *Washington Post* which stated: "The Secretary General of the Organization of Petroleum Exporting Countries says dwindling oil reserves will lead to a decline in world production by 1985 that would cause a 'major crisis' among industrialized nations unless new supplies are found" (*The Washington Post*, 1980). Furthermore, feedback, provided in the form of a Gallup poll conducted in May 1979, found that 33 per cent of the public considered "energy" to be the most important problem facing the country, compared to just 14 per cent in February of the same year (George, 1979).

Carter's July 15, 1979 'crisis of confidence' speech highlighted the extent to which the events of that year focused attention on America's continued vulnerability in the face of restricted foreign oil

supplies. Indicating the beginning of a new era in terms of energy policy, Carter declared: “Beginning this moment, this nation will never use more foreign oil than we did in 1977... the generation-long growth in our dependence on foreign oil will be stopped dead in its tracks right now and then be reversed as we move through the 1980s” (Carter, 1979). In his 1980 State of the Union speech, Carter once again stressed the need for a strong U.S. energy policy, even threatening the use of military pressure:

“An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of America. And such an assault will be repelled by any means necessary, including military force. The crisis in Iran...has dramatized a very important lesson: Our excessive dependence on foreign oil is a clear and present danger to our nation’s security...the biggest single factor in increased inflation in the last year was from one cause: skyrocketing prices of OPEC oil” (Carter, 1979).

The entrenched nature of the energy problem that was revealed by the 1979 oil crisis reinvigorated the search for solutions. During this period, the key goal of the policy efforts was to increase energy supplies. Indeed, Carter’s energy policy proposals placed much more focus on increasing domestic energy supplies than did his previous energy plan (Hakes 2008, 60).

Renewable energy also received extensive attention during Carter’s presidency. In 1979 he issued a goal of generating twenty percent of the nation’s energy from renewable sources by the end of the century (Hakes, 2008). The focus on energy conservation and domestic renewable energy development that had been reinforced by the second energy crisis also had important implications for ethanol. This was evinced by the *Crude Oil Windfall Profit Tax Act* of 1980, which required that the \$3.5 billion annual budget for energy research be supplemented with part of the profits from the tax. Further, the *Energy Security Act* provided an extension of the tax break for ethanol from 1984 to 1992.

In brief, the 1970s represented the decade in which energy problems that had been developing for some time achieved prominence and received increased attention from policymakers’ through a variety of feedback and a series of dramatic focusing events. Consistent with Kingdon’s theory that it sometimes requires some kind of push to get people to see an old problem in a new way, the events of the 1970s do appear to have facilitated a redefinition of the energy ‘situation’ in the U.S. This reclassification of the energy problem appears to have generated a high degree of saliency in energy policy. Thus, the goal of achieving ‘energy independence’ through conservation and domestically produced fuels ultimately led policymakers to seriously consider ethanol as a means of achieving this goal for the first time.

During the 1970s a range of environmental conditions also came to be recognised as problematic. Issues of concern during this period included, but were not limited to: air and water

pollution, wildlife protection and environmental degradation (Dunlap et al. 1992, 3-15). Several institutional developments, changes in public discourse, changes in problem definition, and dramatic focusing events combined during this period to make environmental issues highly salient for key figures in and around government (Laird 2001, 120). The 1970s oil crises and the nuclear accident at Three Mile Island, for instance, played a significant role in ensuring that the environmental policy received increasing attention.

The growing emphasis placed on environmental issues was further demonstrated by the rise of the environmental movement. What had begun as a seemingly elitist ideal during the 1930s expanded in the late 1960s and 1970s to encompass a broad range of national and 'grass-roots' interests (Dunlap et al. 1992, 3-9). Notable national environmental organisations that emerged during this period included the Sierra Club, the Audubon Society, and Friends of the Earth.

Increasing awareness of human-induced environmental problems, particularly air quality problems, was also reflected in the behaviour of the federal government. In his 1970 State of the Union address, President Nixon recognised the importance of environment protection and approved the first 'Earth Day' (Laird 2001, 120). Further evidence of federal acceptance of environmentalists' view of environmental quality as a social problem is demonstrated by the creation of two new federal agencies. The Environmental Protection Agency (EPA) and the Council on Environmental Quality were required to produce 'environmental impact statements' on a range of topics (Dunlap et al. 1992, 3). A series of federal legislative acts aimed at combating air pollution are also indicative of the seriousness with which Congress regarded the problem. The fast action taken following reports that 'smog' over major cities was causing respiratory problems amongst some residents, for instance, resulted in a series of amendments being made to the Clean Air Act to tighten air quality standards (Dunlap et al. 1992).

The 1970s also represented the decade in which linkages between the environment and energy began to be recognised by policymakers. Indeed, according to Kash et al. (1985, 435), "perhaps the most striking feature of the struggle to define U.S. energy policy goals in the wake of the oil embargo was the tenacity with which decision makers held to the commitment of clean energy. Despite that commitment providing considerable obstacle to the rapid development of some energy sources such as coal." This commitment to environmental protection was demonstrated by the tightening of air quality standards between 1970 and 1980. More indications can be found in the adoption, during this period, of stricter regulatory programs for the reclamation of mined lands, and oil and gas development both on the outer continental shelf and federal onshore lands (Kash et al. 1985).

In summary, the 1970s was an era in which environmental degradation was increasingly regarded as a highly significant problem. Feedback and a high degree of environmental group participation provided the impetus for a fundamental reorientation of thinking regarding the

environment. The decade also denoted the period in which environmental disruption caused by the use of conventional fuels was recognised.

## 4.2 Problems of the 1980s

Despite the central position on the agenda that energy occupied in the 1970s, by the 1980s the issue appears to have faded from prominence. According to Kingdon, problems fall from the agenda for a variety of reasons. In the case of the energy, the reasons for the decline in interest are complex. However, much impetus appears to have been taken away from the 'problem' by falling international oil prices. In the U.S., drivers who had paid \$1.40 per gallon of gasoline in early 1980 paid only 80 cents by 1986 (Hakes 2008, 79). A number of factors contributed to the drastic fall in oil prices, including a significant decrease in demand, thought to have been a result of the conservation measures that were introduced during the Carter Administration (Ibid. 78-79).

Falling oil prices were also attributable to action of the Saudi Arabian government. In response to decreases in U.S. demand for oil, the country concluded that the OPEC strategy of cutting production to prop up oil prices was collapsing (Ibid. 78). In the summer of 1986, Saudi Arabia decided to increase oil production in an attempt to gain revenues from increasing market share rather than through higher prices. This move was replicated a year later by other OPEC nations. As a result, the price of OPEC oil, which had stood at \$25 per barrel in mid 1985, fell to \$10 per barrel by mid 1986 (Ibid. 77-79). In turn, falling oil prices had a significant impact on the perceived viability of many alternative fuels, including ethanol. As such, despite the continuation of ethanol subsidies, the high cost of producing ethanol, combined with the low price of oil, resulted in the closure of as many as 50 per cent of U.S. ethanol production facilities during this period (EIA, 2008).

During the 1980s another reason for the minimal attention accorded to energy and energy security was the election of President Ronald Reagan. With the perception of his election as a mandate for his free-market energy ideology, Reagan rejected the need for *any* energy policy, declaring the resolution of most energy matters to be the province of the marketplace (Kash et al. 1985, 437-438). Under the free-market place approach, the Reagan Administration also advocated for the repeal of the Windfall Profits Tax, the Synfuels Corporations, mandatory efficiency standards and fuel allocation, as well as the tax credits for alternative fuels (Hakes 2008, 71-72).

Similarly, energy security, which had ranked so highly as matter of concern in the 1970s, was to be left predominantly to the free market throughout the 1980s. The low level of importance placed on the generation of policy to address issues related to energy security became clear as early as 1981, when the administration indicated it would place "primary reliance on free-market forces to determine the price and allocation of energy supplies even during an energy crisis" (Kash et al. 1985, 439).

Despite the falling interest in energy and energy security during the 1980s, another problem emerged to fill the 'void'. A reoccurring problem since the 1930s, the 1980s 'farm crisis' refocused the attention of policymakers' on the rising cost of farm deficiency payments as well as the impact increased payments were having on the federal budget. Deficiency payments increased dramatically in the 1980s, rising from \$88 million in 1978 to \$25.8 billion in 1986, an increase that made these payments one of the largest components of agricultural commodity program costs (Libecap 2003, 93). Among the primary recipients of these payments were corn farmers, who in 1986 (at the height of the crisis) received \$6 billion in deficiency payments (Johnson et al. 2000, 14-15). In addition, the federal budget was also increasing and had generated both financial and political concern (Johnson et al. 2000). In 1985, a report released by the Congressional Budget Office (CBO) indicated that tax payers would save about \$28.9 million in a period of five years if the deficiency payments were eliminated (Libecap 2003, 93).

The 1980s rural economic crisis is thought to have resulted from a variety of factors. These included the decline in rural farmland values, and increased competition in the global agricultural industry. The economic decline within the petroleum and timber industries and rural-based mining, as well as the slow recovery after the economic crisis of the early 1980s also played an important role (LaCaille John, 1995). By early 1984, farm indebtedness had risen to \$215 billion, almost double what it had been in 1978, and fifteen times more compared to the 1950s level (Ball et al. 1984). During the crisis, Emmanuel Melicher, a Senior Economist at the Federal Reserve Board, indicated that more than one third of America's commercial farmers were in "serious trouble", with the total interest payment on farm loans exceeding the total net farm income for the first time (Ball et al. 1984). As a result of the crisis, many U.S family farms went bankrupt and their lands were foreclosed. Between 1981 and 1986, an estimated 150,000 farms went bankrupt - nearly 43,000 in 1985 alone (Calomiris et al. 1986). The severity of the rural economic crisis forced the Reagan Administration to abandon plans proposed in the early 1980s to severely cut back farm subsidy payments. Instead, rather than reducing payments, Congress opted to increase them (Calomiris et al. 1986).

The economic problems within the agricultural sector and the effects on the broader national economy were reflected widely in Congress. During hearings, emphasis was placed on urging all levels of government to examine ways to strengthen the rural economy. This theme was highlighted in a statement made by Deputy Secretary Peter Myers of the Department of Agriculture (USDA) on May 19, 1987 to the House Agricultural Committee:

"While keeping the farmer ever in mind, the "people's department" must now turn its attention to the farmers' neighbours – to Main Street, U.S.A.; those neighbours that buy the farmers' products and sell him most of the materials needed to produce them. Their financial health is influenced by the farmers' economic well-being. So all of the

help we have been giving to farmers is also important to rural communities, generally. Farming is the dominant economic activity in many parts of rural America, and we want to continue to nurse it back to health. However, all parties with an interest in the future of rural America have to look at strategies that will diversify the rural economy. Planning officials at all levels of government, plus private industry, must look for economic activities that fit in the rural community...” (LaCaille John, 1995).

During this period, energy production was increasingly recognised by policymakers as an important way of addressing the problems of rural economic decline and increasing deficiency payments. Several Congressional hearings to discuss the effect of alcohol fuels on agricultural production and price support payments were held throughout the 1980s.<sup>3</sup> In particular, ethanol was presented as an important method of reducing support payments to farmers (Libecap 2003). Since 95 per cent of ethanol is made from corn, ethanol production was a convenient source of demand for corn stocks to help reverse the fall in domestic prices (Johnson et al. 2000, 10). Further, as farm deficiency payments continued to grow, a 1984 Government Accountability Office (GAO) report indicated that the cost of ethanol subsidies might be offset by the reduced costs of agricultural price support programs (Libecap 2003, 93). Therefore, although the cost of producing ethanol in 1980 was almost twice that of gasoline, the economic problems within the agricultural sector meant that ethanol was increasingly understood to be an important way of affecting demand for corn (a major recipient of farm deficiency payments), and, thus, keeping “agricultural program costs in check” (Johnson et al. 2000, 11-14).

To summarise, the 1980s represented a decade in which the energy and energy security problems, ‘renewables’ such as ethanol had begun to be linked to in the 1970’s faded from the agenda. However, the 1980s also represented the decade in which underdevelopment of the rural economy was re-recognised as a significant national problem. The dramatic increase in deficiency payments and the impact this was having on an already growing federal budget deficit increased scrutiny of farm subsidy programs. Consistent with Kingdon’s suggestion that when programs become very costly, policy makers sometimes rethink future initiatives, the farm crisis appears to have generated a high degree of saliency around examining options for strengthening the economic

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<sup>3</sup> See U.S Congress. Senate. 1980. Committee on Agriculture, Nutrition, and Forestry. Agricultural Production, Marketing, and Stabilization of Prices Subcommittee. ‘Hearing on the Effect of Alcohol Fuels Development on Agricultural Production, Price Support Programs and Commodity Reserves’, 96<sup>th</sup> Cong., 2<sup>nd</sup> Sess., March 4, 1980; U.S. Congress. House. 1984. Committee on Science, Space and Technology. Energy Conservation and Power Subcommittee. ‘Hearing on Methanol as Transportation Fuel’, 98<sup>th</sup> Cong., 2<sup>nd</sup> Sess., April 4, 25, 1984. U.S. Congress. House. 1984. Committee on Agriculture. Investigations and Oversight and Wheat, Soybeans, and Feed Grains Subcommittees . ‘Hearing on Developments in the Production and Use of Ethanol Fuels’, 98<sup>th</sup> Cong., 2<sup>nd</sup> Sess., July 6, August 14, 1984. (Johnson et al. 2000).

conditions of rural communities. Thus, the goal of reducing agricultural deficiency payments and stemming the growth of the federal budget deficit led policymakers to seriously consider ethanol as an important means of stimulating demand for agricultural commodities such as corn.

### 4.3 The Re-Emergence of 'Old' Problems: 1990–2005

The first two sections of this chapter have demonstrated how energy, energy security, environmental, and agricultural problems developed within a historical context. Examining the manner in which these problems evolved over a period of time has revealed how the emergence of these problems enabled ethanol to gain some momentum during this period. The remainder of this chapter demonstrates how the problems that developed through the 1970s and 1980s re-emerged or were re-recognized from 1990 to 2005. An important component of this process is demonstrating how the relationships between these problems were increasingly recognized. This recognition is a critical element of ethanol's ascent to agenda status because it enabled policy entrepreneurs to present these issues as urgent agenda items that required immediate action.

One area of particular concern in early 1990 was the decline of air quality standards. This issue was brought to the attention of policymakers through monitoring of air pollution in several major cities by the EPA (EPA, 1999). According to one report issued by the EPA in 1990:

“Despite considerable progress, the overall goal of clean and healthy air continues to elude much of the country. Unhealthy air pollution levels still plague virtually every major city in the United States. This is largely because development and urban sprawl have created new pollution sources and have contributed to a doubling of vehicle travel since 1970. Furthermore, scientists and now the public have become concerned about previously unrecognized environmental threats such as global warming, acid rain and air toxics” (EPA, 1999).

The prominent position air quality problems once again occupied on the agenda in 1990 was also reflected in Congress. After a decade of virtual dormancy, Congress voted to amend the *Clean Air Act* in 1990 (CAA 1990) in an attempt address the decline in air quality standards that had been revealed by the EPA (EPA, 1999). The CAA (1990) strengthened components of the earlier law, and introduced several entirely new concepts with regard to reducing motor vehicle-related air pollution. One particularly significant element of the CAA (1990) was its recognition of *fuel*, as well as vehicle technology, as a potential source of emission reductions.

Despite the successful passage of the CAA (1990) environmental issues remained a priority throughout much of the 1990 to 2005 period. The high degree of consideration given to environmental issues in both the Senate and the House is demonstrated by the enactment of thirty-six major environmental protection bills during the 106<sup>th</sup> Congress alone (Lee, 2000). The numerous hearings held to discuss a diverse range of environmental issues during the 106<sup>th</sup>-109<sup>th</sup>

Congresses also serve as evidence of this.<sup>4</sup> Topics discussed at these hearings included environmental issues such as air quality, solid waste disposal, asbestos, climate change, nuclear energy and nuclear waste disposal. However, of particular concern during this period were issues related to water quality. The quality of water became a prominent issue in 1998 after a number of studies conducted by federal and state environmental agencies detected MTBE in ground water throughout the country; in some instances these contaminated waters were identified as sources of drinking water (EPA, 2009). The MTBE problem was discussed in numerous hearings that took place during the 106<sup>th</sup> through 109<sup>th</sup> Congresses, most of which concentrated on how to balance the importance of clean air and clean water.<sup>5</sup>

Feedback from an enormous array of national and international bodies about the global warming effects of greenhouse gases (GHG) also enhanced recognition of the need to reduce anthropogenic GHG emissions *worldwide* (Santini et al. 1999, 7). At the Kyoto Conference held in December 1997 in Kyoto, Japan, the United States provisionally committed to reduce its GHG emissions by seven percent by 2012 relative to its 1990 GHG emissions level. However, under a ‘business-as-usual’ scenario the GHG emissions from the U.S. transportation sector (which accounted for 29% of the nation's total GHG emissions) were expected to continue on an upward trend due to projected rises in the number of vehicle miles travelled (Santini et al. 1999). In 1999, the EPA reported that substantial reductions in U.S. transportation GHG emissions per vehicle mile travelled would be necessary to achieve the Kyoto goal (EPA 1998).

The second issue that re-emerged during this period was the growing cost of federal farm subsidy programs and the increasing federal deficit. However, when the Farm Bill of 1996 (P.L. 104-127) was being formulated in 1995 and 1996, the farm economy was experiencing a boom. Prices for most commodities were at record highs, as was farm income (Jones 2001, 2-4). Foreign demand for U.S. agricultural goods was expanding, particularly in Asia and Latin America. At the same time, legislators in Congress were also facing constraints because of severe budget deficits that added pressure for changes to farm policy that would better control farm program spending (Jones 2001, 2-4).

As a result, Title I of the FAIR Act, the *Agricultural Market Transition Act* (AMTA), contained commodity program provisions that capped federal spending and ended land set-asides. The act also capped target prices for most commodities, and created a new farm income support system to

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<sup>4</sup> See U.S. Congress. Senate. 2000. Committee on Commerce, Science, and Transportation. ‘Hearing on the Solution to Climate Change’, 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 21 September, 2000; U.S Congress. Senate. 2002. Committee on Environment and Public Works. ‘Hearing on Clean Air Act: Risks from Greenhouse Gas Emissions’, 107<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 13 March, 2002.

<sup>5</sup> See U.S. Congress. 2000. Committee on Agriculture, Nutrition, and Forestry. ‘Hearing on MTBE Crisis and the Future of Biofuels’, 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 18 April, 2000, 1-121; U.S. Congress. 2002. Committee on Commerce. Environmental and Hazardous Materials Subcommittee. ‘Hearing on MTBE Contamination in Groundwater: Identifying and Addressing the Problem’, 107<sup>th</sup> Cong., 2<sup>nd</sup> Sess., May 21, 2002

replace target price supports. Farmers that chose to participate in this new program were to receive fixed, gradually declining, annual payments (Jones 2001). The expectation was that over time the amount of AMTA payments would decline and end completely after 2002, by which point farmers would have adjusted to a free-market (Jones 2001).

By late 1997, however, problems in the farm economy had re-emerged as farm income began to decline. The USDA and numerous state agricultural authorities whose constituents had been affected provided feedback on the extent of the problem. In his testimony before the Subcommittee on Agriculture and Rural Development, USDA Chief Economist Keith Collins highlighted the problem and provided reasons for the decline:

“In addition to historically low agricultural commodity prices, many producers the past couple of years have been adversely affected by drought, excessive heat, pests, flooding and wind which lowered crop yields and quality, reduced forage supply and quality and lowered milk production. In recent months, many areas of the United States have experienced subnormal precipitation. Unseasonably mild and windy weather also has accompanied the lack of precipitation since October, increasing the evaporation of moisture from the topsoil. Soil moisture levels are very low in the northern Great Plains and upper Mississippi Valley due to the prolonged absence of precipitation. Another area, extending from western Texas to southern California, also remains very short of soil moisture. In addition, parts of the Great Plains, eastern Corn Belt, mid-Atlantic and New England endured long-term drought in 1999, depleting subsoil moisture reserves in those areas” (Collins, U.S 106<sup>th</sup> Cong., 2000).

As a result of the problems that had re-emerged in the agricultural sector, the previous concepts of self-sufficiency and independence from federal farm programs were abandoned, and the President signed in seven emergency farm aid bills in 1999, 2000, and 2001. These ad hoc emergency spending measures provided approximately \$33 billion to agriculture (primarily to corn, wheat, oilseed, cotton and rice farmers), resulting in the recognition of the farm support program as the “most expensive and visible of all Federal farm activities” (Becker 2001, 1).

Despite the assistance payments, however, optimism about the potential for the agricultural sector to recover appears to have remained low. In a statement made before the Senate Committee on Appropriations, Collins pointed out that:

“While an overall farm economic crisis during the past year of generally weak markets has been averted, in part due to emergency assistance, market fundamentals remain weak, especially for crops. Global economic prospects are improving, yet commodity supplies are large and rapid recovery in farm income appears unlikely. In fact, under current legislation and programs, net cash farm income in 2000 is projected to be the lowest level since 1986” (Collins, U.S 106<sup>th</sup> Cong., 2000).

Another problem to re-emerge in the late 1990s was energy and energy security. The renewed focus on energy was initially triggered by a rise in oil prices that began in early 1999. The result of an OPEC decision to reduce oil production in March 1999, combined with a world economic recovery that was shoring up demand, caused prices to jump to a high of \$26.10 per barrel by December 1999 (EIA 2008). Several focusing events that followed the oil price increases of late 1999 reinforced the problems within the energy system. First, problems in the Northeast during the winter of 1999-2000 put fresh pressures on supply systems. Unexpectedly severe weather disrupted waterborne transport of home heating oil to New England (Bamberger 2002, 2-3). The Midwest also experienced a shortage of gasoline in mid-2000 (Ibid.). And, the 2001 power shortages in California (largely blamed on California's restructuring program), all contributed to oil prices remaining above \$25 per barrel throughout most of 2001 (EIA 2008).

The seriousness with which policymakers considered the topic of energy from 2000 to 2001 is reflected in the high degree of congressional attention. Congress held numerous hearings to discuss a range of energy issues throughout the 106<sup>th</sup> and 107<sup>th</sup> Congresses.<sup>6</sup> Most of these hearings emphasised the severity of the shortages, the volatility of the oil markets, the impact on the national economy and the need to find solutions. Tom Bliley commented on this in his opening statement before the House Committee on Commerce, in which he declared:

“Every now and then an issue arises that demands the attention of all of us in one room. Today we are going to be talking about energy and consumer protection...We are here today for answers. Our constituents back home are concerned about the sticker shock at the gas pump and the headlines they read about the electricity demands. I want to get to the bottom of what is causing price hikes for gasoline and what we in Congress can do about it. I also want to make sure that we have a steady, affordable power supply this summer and in the future” (Bliley, U.S 106<sup>th</sup> Cong. 2000, 2).

Tellingly, when putting the current energy situation in context, several of the speakers at these hearings also made reference to the focusing events of the 1970s. For example, Senator Joe Barton, in his opening statement before the Subcommittee on Energy and Power stated: “Anybody in this room who is over 40 years old certainly remembers the gasoline lines of the late 1970's and early 1980's” (Barton, U.S. 106<sup>th</sup> Cong. 2000, 2). The importance of these series of focusing events as a trigger for policy change was also reflected in government by the introduction of an “enormous

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<sup>6</sup> See U.S. Congress. House. 2000. Committee On Commerce. Energy and Power Subcommittee, ‘Hearing on the Ongoing Energy Concerns For The American Consumer: Natural Gas And Heating Oil’. 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 28 September, 2000; U.S. Congress. Senate. 2001. Committee On Energy And Natural Resources. ‘Hearing on National Energy Issues’. 107<sup>th</sup> Cong., 1<sup>st</sup> sess., May 24, 2001; U.S. Congress. House. Committee on Government Reform. Energy and Resources Subcommittee, ‘Hearing on Energy Demand in the 21<sup>st</sup> Century: Are Congress and the Executive Branch Meeting the Challenge?’, 109<sup>th</sup> Cong., 1<sup>st</sup> Sess., March 16, 2005.

range of [energy] proposals”, including the Bush administration’s own National Energy Policy Plan issued on May 16, 2001<sup>7</sup> (Bamberger 2002, 12). Both parties also introduced comprehensive energy legislation in the Senate in March of 2001 (Bamberger 2002, 12).

Several focusing events that occurred in late 2001 to 2003 reinforced the problems of oil market volatility and energy insecurity. These included the wars in Afghanistan and Iraq in 2001 and 2003 and the general strike in Venezuela in 2002. The California electricity ‘blackouts’ in 2003, and continued oil price increases throughout early and mid 2000s (a combined result of all of these events) further reinforced the oil problems. Of particular importance, however, were the September 11 terrorist attacks. The September 11 attacks clearly constitute the type of focusing event Kingdon refers to. The importance of the attacks as a rationale for policy change was reflected in several news articles (Felon et al. 2001; Stephenson 2001; Woodlief 2001). These articles reinforced the sentiment expressed in an article in the Ottawa, Ontario newspaper in 2001: “The terrorist attack on the United States is the sort of historical event that permanently changes the way people think” (Birkland 2004, 182).

In Congress, the theme of change was often voiced in ways that would justify changes in attitudes or policies regarding energy. Many of these discussions highlighted the danger of continued U.S reliance on ‘foreign’ oil due to the geopolitical ramifications of such a dependency, and emphasised the need to attain ‘energy independence’ (Hutchison 2002, S1439-S1441; Weldon 2002, H1389; Wilson 2002, H3676).

The Energy Information Administration (EIA) and other forecasters also significantly increased their long-term projections for the price of oil in the wake of these events. The EIA’s ‘Annual Energy Outlook for 2001’ forecasted that the world price of oil would reach just under \$22.50 per barrel by 2020 (EIA 2000). By 2004, the EIA had revised its forecast, instead predicting the price to increase to \$26 per barrel by 2020 (EIA 2004). In 2006 this figure was revised once again, predicting that it was possible that the price of oil could reach as high as \$50 per barrel by 2020 (EIA 2006).

By the early 2000s the problems of energy, energy security, declining farm income, and environmental degradation appear to have converged. This differs from the 1970s and 1980s where feedback commonly addressed each problem in relative isolation to the others. Evidence of this convergence is illustrated in feedback provided by various public and private entities that considered the effect one set of problems was having on another.

First, while policymakers had acknowledged the link between problems of environmental degradation and increasing levels of oil consumption for some time, the issue of ratification of the Kyoto protocol brought the issue to the fore in 2000. Ann Mesnikoff of the Sierra Club, for

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<sup>7</sup> For full report see National Energy Policy: Report of the National Energy Policy Development Group. 2001. <http://www.whitehouse.gov/energy/National -Energy-Policy.pdf>

example, highlighted the relationship between air pollution and oil consumption, as two intertwined problems that required urgent action:

“I think it is a story that demands action on what is a very serious pollution problem. And it is a pollution problem, and America’s cars and light trucks are 20 per cent of U.S. greenhouse gas emissions. They guzzle 40 per cent of the oil we use and transportation is the fastest growing sector of greenhouse gas emissions in the United States. I think that it is a pollution problem, and the good news is we can do something about it” (Mesnikoff, U.S. 106<sup>th</sup> Cong. 2000, 7-10).

In Congress, the relationship between energy security and farm income was also increasingly discussed by early 2000. A statement made by the Senior Vice President of Industry and Agriculture at Wefa, Inc. shows the links being made between oil price increases and the effects on agricultural economies:

“Farmers have a lot at stake with respect to energy costs and our national energy policies. In the aggregate, farmers expended on direct energy inputs an average of over \$9 billion per year between 1996 and 1999. By my calculations, that is nearly 5.5 per cent of total cash expenses and about 5 per cent of total production expenses. Estimates of energy expenditures on cash costs are expected to rise considerably for the year 2000. By my estimates, we are looking at a rise in direct energy costs of close to \$2.5 billion, pushing the figure to almost \$12 billion for the year 2000. Total cash expenses are also estimated to rise, but at a slower rate, so as a consequence we are looking at direct energy costs to increase their share of total cash costs to about 7 per cent from 5 per cent. If we look at individual crops, direct energy costs expended by farmers on corn per acre have averaged somewhere between \$24 to \$25 per acre, according to USDA estimates and WEFA’s estimates over the past 4-years. That is about 15-percent of variable cash expenses” (Baumes, U.S 106<sup>th</sup> Cong. 2000, 37).

Congressional discussions also highlighted connections between environmental problems and declining farm income. In particular, discussion focused on the links between the weather variations that result from global warming and the effect on agricultural commodities. For example, Legislative Director of the National Environmental Trust, Debbie Reed, speaking at a Senate hearing to discuss the issue of energy and agriculture stated:

“Global warming is a threat to agriculture. U.S. agriculture is a major industry. Farming contributed \$80.6 billion or .8 per cent to the national gross domestic product in 2001. However, the threat of global warming and potentially severe weather events jeopardize the very livelihood of farmers in rural communities, as well as the ability of agriculture to continue to fuel U.S. prosperity” (Reed, U.S. 108<sup>th</sup> Cong., 2003, 21).

In summary, by early 2000, the energy and environmental problems of the 1970s, and the agricultural problems of the 1980s, appear to have come to a head. The above statements provide evidence of the recognition of the interconnected nature of the problems of energy, energy security, oil consumption and cost, agriculture, and environmental degradation. By 2000, part of each problem was being discussed in conjunction with ongoing and frequently discussed problems in the 'separate' policy domains. Consistent with Kingdon's framework, the convergence of the problems was reliant on several mechanisms that indicated to policymakers that these conditions had re-emerged as problems. The mechanisms identified include: (1) feedback provided by a variety of public and private entities, (2) several more or less systemic indicators provided by such government agencies as the EPA, the USDA, and the Department of Energy's Energy Information Administration (among other governmental and non-governmental organisations), and (3) a series of substantial focusing events.

The convergence of energy, environmental, and agricultural problems in 2000 enabled the creation of a particularly powerful window of opportunity for ethanol. This assessment is based on observations of policy windows during the 1970s and 1980s when ethanol was able to gain some momentum by being linked to specific problems within these sectors. Thus, evidence of recognition of the increasingly intertwined nature of the problems in early 2000 suggests that the window was particularly potent given the compounded nature of the problems. However, according to Kingdon, a salient problem is not enough to promote an item to the agenda. Other variables that must be considered are the process of generating ideas, and the presence of favourable political conditions. As such, the next chapter discusses the development of the ethanol solution within the community that makes-up the policy stream.

## CHAPTER 5: THE POLICY STREAM

Within the second stream, the policy stream, policy solutions are generated by way of a process Kingdon compares to biological natural selection. Through the imposition of criteria, some ideas and proposals are selected for survival while others are discarded. The most important criteria are technical feasibility and value acceptability. According to Kingdon, proposals that do not meet these criteria are less likely to survive than proposals that do meet these standards (Kingdon 1995, 201). A long softening-up process is also considered to be critical to policy change.

This chapter identifies the most important actors within the policy stream. The actors that make-up this stream are: interest groups, state agencies, and a wide range of specialists from the academic and scientific communities. The chapter illustrates how the activities of these groups (carried out over a number of years) influenced the development of the ethanol idea. The chapter concludes with a brief overview of the policy stream in its entirety.

### 5.1 Interest Groups

Kingdon describes interest groups as “looming very large” with regard to the influence they exert on the alternatives considered by policymakers (Kingdon 1995, 47-48). In terms ethanol, a review of the literature reveals a high degree of visibility of several key interest groups. Despite the divergent motivations of some of these groups, it appears that they have, for the most part, exhibited a high level of coordination. This section identifies several of the interest groups who had an important role in developing the ethanol idea. An attempt will also be made to identify the most prominent amongst those groups who opposed this advancement.

One interest group that played a particularly prominent role in influencing the development of ideas related to ethanol was the Renewable Fuels Association (RFA). In terms of Kingdon’s distinction between “public interest groups” and “self-interested” business and industry groups, the RFA clearly represents the latter (Kingdon 1995, 47-48). Formed in 1981, the RFA claims it serves as a “vital link between the ethanol industry and the federal government, including Congress and the Administration, to promote increased production and use of ethanol through supportive policies, regulations, and research & development initiatives” (RFA 2010, 1). RFA membership is comprised of a range of ethanol producers, gasoline marketers, state agencies, and farm organisations such as agri-business giant Archer-Daniels Midland (ADM).

The RFA has been highly visible in its efforts to promote the expanded use of ethanol. An examination of congressional hearings that took place during the 1987 to 2005 period, in the 100<sup>th</sup>-

109<sup>th</sup> Congresses, demonstrates a strong RFA presence.<sup>8</sup> However, the RFA was particularly visible during 1999 to 2005, providing witness testimony to link ethanol as a solution to the problems that had re-emerged during this period. In June 28, 2000, Eric Vaughn, President and CEO of the RFA, appearing before the House Committee on Government Reform to discuss ‘skyrocketing’ gasoline prices in the Midwest stated:

“This is a timely and critically important hearing. The causes of the unacceptably high gasoline prices in the Midwest are numerous, and ethanol can help both in the near term as the Midwest begins to address soaring gasoline prices and the long term as the United States develops a more responsible and proactive energy policy...Renewable alternative fuels such as ethanol are part of the solution, both today and in the future” (Vaughn, U.S. 106<sup>th</sup> Cong. 2000, 260-264).

Often, the RFA presented multiple justifications for the expanded use and production of ethanol. RFA arguments included: reducing demand for oil imports, enhancing energy security, helping to build a strong domestic energy resource and reducing air pollution. In addition to advocating ethanol as a way of assisting farmers, they also predicted federal government net annual gains due to increased tax revenues, and reduced costs of farm programs (RFA, 2004). An illustration of RFA use of many of these arguments is observed in a single paragraph of a witness statement provided before the Energy and Commerce Subcommittee during a hearing to discuss issues concerning the use of MTBE in reformulated gasoline. Speaking on behalf of the RFA, President and CEO, Bob Dinneen (2001-2011) declared:

“We see ethanol as a solution. Farmers are prepared to be the foot soldiers in the battle for energy independence. Increasing ethanol use will allow MTBE to be reduced cost effectively. Stimulating rural economies by increasing the demand for grain used in ethanol production will help American framers. Encouraging new ethanol production from cellulosic feedstocks will provide additional economic and environmental benefits as ethanol production is expanded beyond the grain belt. The bottom line is

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<sup>8</sup> See Vaughn, E. (RFA). U.S. Congress. 1987. Committee on Energy and Commerce, Energy and Power Subcommittee. ‘Hearings on H.R. 168, H.R. 1595, H.R. 2031, and H.R. 2052, Bills to Encourage the Replacement of Gasoline with Alternative Fuels’, 100<sup>th</sup> Cong., 1<sup>st</sup> Sess., 17, 24 June and 9 July, 1987, pp.105, 118, 127-8, 140-155, 161; Dinneen, B (RFA). U.S. Congress. Senate. 2003. Committee on Environment and Public Works. Clean Air, Wetlands, Private Property, and Nuclear Safety Subcommittee. ‘Hearing on Proposal Regarding Fuel Additives and Renewable Fuel’, 108<sup>th</sup> Cong., 20 March, 2003, Retrieved 3 February, 2010, from [http://epw.senate.gov/108th/Dinneen\\_032060.htm](http://epw.senate.gov/108th/Dinneen_032060.htm); Dinneen, B (RFA). U.S. Congress. Senate. 2003. Finance Committee. 108<sup>th</sup> Cong., 26 August, 2003. Retrieved 20 March, 2010, from <http://finance.senate.gov/imo/media/doc/082603test.pdf>; Dinneen, B (RFA). U.S. Congress. Senate. 2000. Committee on Agriculture, Nutrition, and Forestry. Research, Nutrition and General Legislation Subcommittee. ‘Hearing on MTBE Crisis and the Future of Biofuels’, 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 18 April, 2000, 25-27.

that we need to protect both air quality and water quality. With ethanol we can.”  
(Dinneen, U.S. 107<sup>th</sup> Cong. 2001, 48).

To promote the ethanol solution, RFA strategies sometimes included the pursuit of more obscure administrative rulings rather than the more open legislative process. For example, the RFA was actively involved in lobbying the EPA to issue a Renewable Oxygenate Rule (ROR). This rule required that at least 30 per cent of the oxygenates used in the Reformulated Gasoline Program (RFG) come from renewable sources.<sup>9</sup> Clearly aimed at expanding ethanol’s market share of oxygenate additives, the strategy utilised by the RFA is believed to have made it more difficult for MTBE supporters to counter claims made on ethanol’s behalf (Johnson et al. 2000, 22-23). At the same time the strategy also “rais[ed] the costs to voters of monitoring the costs and benefits of ethanol policies” (Ibid.).

The RFA has also played a central role in providing the statistical information to demonstrate the ethanol industry’s ability to meet any increased demand created by the implementation of policy aimed at expanding the use of ethanol (RFA, 2004). When the RFA appeared at congressional hearings, concerted effort always appeared to have been made to stress the industry’s rapid growth and capacity to cope with increased demand:

“The U.S. ethanol industry today is the fastest growing energy industry in the world. We produced 2.8 billion gallons of ethanol last year. That is 32 per cent more than we had the previous year and about double our production from just four years ago. Importantly, the fastest growing segment of the ethanol industry is small businesses. Farmer owned cooperatives that want to seize control over their own product. As a whole, farmer owned ethanol facilities are now the single largest ethanol producer in the country, providing critically important value added economic stimulus to rural America” (Dinneen, U.S. 108<sup>th</sup> Cong. 2004).

RFA involvement in this area of the policy stream was important in demonstrating the industry’s ability to mitigate potential of future constraints surrounding the supply of ethanol (a criticism often used by opponents of ethanol).

Duane Adams, representing the Corn Growers Association (NCGA), provided additional witness testimony at the same congressional hearing. Formed in 1957, the NCGA coordinates the policy effort of a diverse collection of corn-grower associations at both the local and state level. In addition to the RFA, the NCGA became an increasingly visible actor in the policy stream, appearing at a number of congressional hearings to promote ethanol ideas throughout 1990 to

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<sup>9</sup> See 59 Federal Register 39258, 1994. See also, Committee on Toxicological and Performance Aspects of Oxygenated Motor Vehicle Fuels, Board on Environmental Studies and Toxicology, Commission on Life Sciences, National Research Council, *Toxicological and Performance Aspects of Oxygenated Motor Vehicle Fuels*, Washington D.C.: National Academy Press, 1996, p. 4. (Johnson et al. 2000).

2005.<sup>10</sup> There is also much evidence of NCGA activity with regards to what Kingdon describes as “bargaining” and “softening-up” activities. Some of these efforts were highlighted by the NCGA itself, in a statement to Congress regarding the benefits of tax incentives for producers of renewable fuels and its impact on small businesses and farmers:

“N.C.G.A policy strongly supports current renewable programs. We have joined with the others in the ethanol industry to seek ways to advance common sense solutions to problems we have had. We worked hard to reach a historic agreement with the petroleum industry that calls for flexibility for gasoline blenders and establishes a renewable fuels standard that provides stability for the renewable fuels industry. We joined with the highway construction industry and state governors to fix a problem created by the current excise tax credit. The volumetric Ethanol Tax Credit legislation is a bipartisan solution that helps states that want to use ethanol and need to invest in highway infrastructure. It solved some sticky political problems for both industries and pointed the way for Congress to pass policy that is good for America and has broad based support” (Adams, U.S. 108<sup>th</sup> Cong. 2004, 46).

In addition to their individual efforts, there is also evidence of an increasing level of cooperation between the RFA and the NCGA in their pursuit of the implementation of policy favourable to ethanol, particularly from 1999 to 2005. An example of this cooperation is demonstrated by the issuance of a joint letter sent to all members of the U.S. House-Senate energy bill conference committee urging them to adopt an eight billion gallon renewable fuels standard (RFS) in the final national energy bill:

“With record gas prices and soaring energy imports, this is a time when the nation should be maximising, not minimising, the use of ethanol and biodiesel...your support for the Senate RFS position will demonstrate your firm commitment to reducing our petroleum imports while encouraging economic growth through a domestic biofuels industry, helping lower consumer fuel prices and protecting the environment” (Shaw 2005, 1).

In addition to the high level of cooperation between the NCGA and the RFA, these two primary interest groups also received considerable support from what the RFA described as: “a coalition

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<sup>10</sup> Adams, D (NCGA). U.S. Congress. House. 2004. Committee on Small Business, Rural Enterprises, Agriculture, and Technology Subcommittee. ‘Hearing on the Benefits of Tax Incentives for Producers of Renewable Fuels and its Impact on Small Businesses and Farmers’, 108<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 6 May, 2004, 45-48; Wilson, G (NCGA). U.S. Congress. House. 2000. Committee on Commerce. ‘Hearing on Summer Energy Concerns for the American Consumer’, 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 28 June, 2000, 317-319; Schmalshof, T (NCGA). U.S. Congress. House. 2005. Committee on Resources. Energy and Mineral Resources Subcommittee. ‘Hearing on the Impacts of High Energy Costs to the American Consumer’, 109<sup>th</sup> Cong., 1<sup>st</sup> Sess., 19 May, 2005, 14-17.

representing agriculture, environmental, consumer, automotive, and renewable fuels groups” (Shaw 2005, 1). Evidence of this support is demonstrated by the additional twenty-three signatories of the same letter sent to members of the House-Senate energy bill conference committee <sup>11</sup> (Shaw 2005, 1).

It is worth mentioning, however, that the positions of some of these groups changed over time. In the years directly following the implementation of the EAct of 2005, the National Farmers Union and the American Farm Bureau Federation withdrew much of their support of ethanol. For the most part, the withdrawal of this support is attributed to the increased cost of corn (a primary source of feed for livestock in the U.S.).

Similarly, the support of some environmental groups (which had initially helped create the necessary support for ethanol) also appears to have begun to wane during the years directly preceding the enactment of the EAct of 2005. Triggered by the increased use of ethanol following the phase-out of MTBE, some environmentalists began to question whether ethanol (particularly corn-ethanol) could provide a meaningful reduction in GHG emissions (Lawrence, 2010, 1-2).

Environmentalists were also concerned that ethanol feedstock production could threaten water supplies and undeveloped land, such as forests and wetlands. Some also began to question whether expanded ethanol production might: (1) put pressure on available agricultural land, (2) increase food prices, and (3) impact poorer consumers. An indication of the waning support provided by some environmental groups is demonstrated by a statement issued by Sandra Schubert, Director of Government Affairs for the Environmental Working Group (EWG): “EWG was one of the first supporters of renewable fuels and ethanol. [But] we’ve seen over the last few years, since the phase-out of MTBE, a lot of what we think are unintended consequences’ (Lawrence, 2010, 1-2).

Despite evidence of some environmental groups reconsidering their support of ethanol in the years directly preceding the mandates, other environmental groups maintained their support for ethanol. This continued support is evidenced by the issuance of an optimistic report on ethanol by the Natural Resource Defence Council titled "Growing Energy" in 2004 (Greene, 2004). The report

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<sup>11</sup> These additional signatories included: The National Biodiesel Board, Environmental and Energy Study Institute, American Farm Bureau Federation, American Soybean Association, National Farmers Union, National Grain Sorghum Producers, Farm Credit Council, New Uses Council, CoBank, Biomass Coordinating Council, CenexHarvestStates, Chicago Board of Trade, U.S. Canola Association, National Barley Growers Association, National Sunflower Association, National Association of Wheat Growers, American Coalition for Ethanol, Ethanol Producers and Consumers, Energy Future Coalition, Alliance of Automobile Manufacturers, and Consumer Federation of America

<sup>12</sup> See U.S Congress. Senate. 1980. Committee on Agriculture, Nutrition, and Forestry. Agricultural Production, Marketing, and Stabilization of Prices Subcommittee. ‘Hearing on the Effect of Alcohol Fuels Development on Agricultural Production, Price support Programs and Commodity Reserves’, 96<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 4 March, 1980; U.S. Congress. House. 1984. Committee on Energy and Commerce. Fossil and Synthetic Fuels Subcommittee and Energy Conservation and Power Subcommittee. ‘Hearing on Methanol as Transportation Fuel’, 98<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 4 April, 1984; U.S. Congress. House. 1984. Committee on Agriculture and Committee on Science, Space and Technology. Investigations and Oversight Subcommittee and Wheat, Soybeans, and Feed Grains Subcommittee. ‘Hearing on the Developments in the Production and Use of Ethanol Fuels’, 98<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 6 July, 14 August, 1984.

was credited with galvanising support for ethanol amongst green groups (Lawrence, 2010, 1-2). Additional evidence of the continued support of some environmental groups is highlighted by the RFA's 2004 "Ethanol Industry Outlook" report. Within this report the RFA identifies the continued support of environmental and health groups including: Northeast States for Coordinated Air Use Management, American Lung Association, Bluewater Network, Clean Energy Now (Greenpeace), Climate Solutions, Earth Island Journal, Environmental and Energy Study Institute, Institute for Local Self-Reliance, Renewable Energy Action Project, and the Union of Concerned Scientists (RFA 2004, 5).

## 5.2 Oppositional Interest Groups

Prior to the mid 1980s, there was minimal opposition to ethanol and its associated subsidies. This general attitude is evinced in several congressional hearings held during the early 1980s, in which claims made by proponents of ethanol were left largely unchallenged by outside parties. The lack of opposing interest groups during this period meant congressional hearings were largely enthusiastic about the potential of several alternative fuels, including ethanol, with respect to achieving energy independence, cleaner air and rural development (Johnson et al. 2000).<sup>12</sup>

In the late 1980s, however, greater interest group opposition to ethanol began to emerge.<sup>13</sup> The mobilisation of oppositional interest groups was particularly apparent following the introduction of several pieces of legislation mandating the use of renewable energies such as ethanol in reformulated gasoline<sup>14</sup>. The introduction of these laws, although ultimately unsuccessful, provoked considerable attention from the gas, chemical, and petroleum industries, which mobilised to protect their MTBE interests (Johnson et al. 2000). Among the most prominent anti-ethanol interest groups that appeared during this period were Conoco, Chevron, ARCO, Amoco, National LP-Gas Association, Service Station Dealers of America, National Petroleum Refiners

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<sup>12</sup> See U.S. Congress. Senate. 1980. Committee on Agriculture, Nutrition, and Forestry. Agricultural Production, Marketing, and Stabilization of Prices Subcommittee. 'Hearing on the Effect of Alcohol Fuels Development on Agricultural Production, Price support Programs and Commodity Reserves', 96<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 4 March, 1980; U.S. Congress. House. 1984. Committee on Energy and Commerce. Fossil and Synthetic Fuels Subcommittee and Energy Conservation and Power Subcommittee. 'Hearing on Methanol as Transportation Fuel', 98<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 4 April, 1984; U.S. Congress. House. 1984. Committee on Agriculture and Committee on Science, Space and Technology. Investigations and Oversight Subcommittee and Wheat, Soybeans, and Feed Grains Subcommittee. 'Hearing on the Developments in the Production and Use of Ethanol Fuels', 98<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 6 July, 14 August, 1984.

<sup>13</sup> See U.S. Congress. House. 1987. Committee on Energy and Commerce. Energy and Power Subcommittee. "Alternative Automotive Fuels," Hearings on H.R. 168, H.R. 1595, H.R. 2031, and H.R. 2052, Bills to Encourage the Replacement of Gasoline with Alternative Fuels', 100<sup>th</sup> Cong., 1<sup>st</sup> Sess., 17, 24 June and 9 July, 1987.

<sup>14</sup> H.R.2031, the Clean Air Act Amendments of 1987, would have required that one half of all U.S. gasoline have at least 10 percent ethanol and the other half to have 5 percent methanol and 1.5 percent ethanol. Similarly, H.R. 2052, the Ethanol Motor Fuel Act introduced in 1987, would have required that 10 percent of all gasoline sold in 1988 be 'gasohol', 15 percent in 1989, 25 percent in 1990, 35 percent in 1991, and 50 percent by 1992 (Johnson et al. 2000).

Association, and the American Petroleum Institute.<sup>15</sup> The arguments against ethanol put forward by many of these groups were based on the absence of conclusive information regarding its potential to improve air quality and energy security, as well as the high cost of production and distribution.

MTBE manufacturers and distributors challenged the air quality advantages of ethanol again, following the EPA's introduction of the Renewable Oxygenate Rule (ROR) (Libecap 2003, 94-95). A review of congressional hearings reveals that this time several environmental interest groups emerged in opposition to the expanded use of ethanol required by the oxygenate mandates. Those interest groups included the Sierra Club, Resources for the Future and the Environmental Defence Fund. All emphasised the ambiguity of the environmental and health claims made by ethanol proponents.<sup>16</sup> The EPA's Renewable Oxygenate Rule was later challenged by the American Petroleum Institute and the National Petroleum Refiners Association, and ultimately reversed by the United States Court of Appeals for the District of Columbia in 1995.<sup>17</sup>

It is important to note that the positions of these oppositional interest groups did not remain static. Following reports of MTBE water contamination in 1997, the debate between supporters of MTBE and ethanol proponents shifted from a one centred on the respective air quality benefits of the oxygenates to one over health and water quality (Libecap 2003, 96-97). Subsequently, concerns over MTBE water contamination led some legislators and environmental groups to question whether oxygenates were necessary at all in order to comply with the *Clean Air Act* (1990). In response, H.R.630 was introduced in 1998 during the 105<sup>th</sup> Congress. Under H.R.630, the *Clean Air Act* oxygenate requirement would have been repealed. This effectively split the already divided environmental lobby opinion on ethanol in yet a third direction. Several environmental groups defected in support of the idea that air quality standards could be achieved without using oxygenates (Johnson et al. 2000).

Interestingly, during the period in which H.R.630 was under consideration, the positions of opponent and proponent interest groups appear to have merged. Evidence of this alignment emerged during a 1998 congressional hearing to discuss the necessity of retaining the oxygenate requirement. At the hearing, MTBE proponent Marvin Schlanger of ARCO and pro-ethanol

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<sup>15</sup> See U.S. Congress. House. 1987. Committee on Energy and Commerce. Energy and Power Subcommittee. "Alternative Automotive Fuels," Hearings on H.R. 168, H.R. 1595, H.R. 2031, and H.R. 2052, Bills to Encourage the Replacement of Gasoline with Alternative Fuels', 100<sup>th</sup> Cong., 1<sup>st</sup> Sess., 17, 24 June and 9 July, 1987, III, IV, 154, 350, 385, 388, 451-466, 490.

<sup>16</sup> See U.S. Congress. Senate. 1994. Committee on Agriculture, Nutrition, and Forestry. Nutrition and Investigations Subcommittee. 'Hearing on Renewable Oxygenate Rules in the Reformulated Gasoline Program', 103<sup>rd</sup> Cong., 2<sup>nd</sup> Sess., 27 May, 1994, 45-80.

<sup>17</sup> United States Court of Appeals for the District of Columbia. 'American Petroleum Institute and National Petroleum Refiners Association v United States Environmental Protection Agency and Carol M. Browner, Administrator, United States Environmental Protection Agency', 28 April, 1994, 94-1502.

advocate Eric Vaughn of the RFA both used similar arguments to object to the implementation of any rules that would effectively constitute a repeal of oxygenate requirement.<sup>18</sup>

The oil industry and MTBE manufacturers' traditional position of strong opposition to pro-ethanol legislation was compromised one final time, prompted by indications that the industry would be required to take responsibility for MTBE water contamination under the *Comprehensive Environmental Response, Compensation, and Liability Act* of 1980 (CERCLA). Under CERCLA, MTBE manufacturers and distributors would be required to cover the costs involved in cleaning up contaminated water, as well as facing financial liability in numerous pending lawsuits. The enormity of the financial implications incited these groups to lobby for the inclusion of a product liability waiver in the final version of the omnibus energy legislation, which would provide a 'safe-harbour' provision for manufacturers of MTBE retro-active to 2003 (Flynn 2004, 1).

During this period, the positions of several major oil interests appear to have shifted, suggesting that some degree of bargaining took place between members of the oil industry and pro-ethanol interest groups. This shift was reflected in a statement made by Edward Murphy, Downstream General Manager of the American Petroleum Institute (a trade association representing the interests of more than 400 oil and natural gas companies) at a hearing held to discuss national energy policy in 2003:

"We believe Congress should repeal the oxygenate content requirement for RFG that is in the Clean Air Act and require a national phase down of MTBE. As part of a package that meets these objectives, we also support a renewable fuels standard that phases up to 5 billion gallons [of ethanol] over several years nationally...we [also] support limited liability protection [for MTBE] that recognizes that when Congress mandates the use of fuels components, it is quite reasonable to disallow defective product claims for introducing that product into commerce...The carefully crafted provisions I have discussed, as part of a package that meets our objectives, are supported by an historic coalition including API, numerous farm and ethanol interests, Northeast state air quality officials and environmental interests" (Murphy, 108<sup>th</sup> Cong. 2003, 433-434).

Although some oil interests did remain strong opponents of the passage of ethanol-friendly legislation, Murphy's statement demonstrates the increased fragmentation of oil interests in their stance on ethanol and several others issues from 2003 to 2005.

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<sup>18</sup> See U.S. Congress. House. 1998. Committee on Commerce. 'Hearing on the Implementation of the Reformulated Gasoline Program in California', 105<sup>th</sup> Cong., 2<sup>nd</sup> Sess., 22 April, 1998, 28-589.

It is clear, then, that both pro- and anti-ethanol interest groups were highly visible within the policy stream. Both groups had carried out softening-up and blocking activities since the late-1980s. Both lobbies have also exerted considerable pressure on various federal agencies in order to implement, block, or repeal pro-ethanol administrative rulings. Since the 1990s, the lobbying efforts of many of these groups have increased. However, the similar level of resources available to each lobby appears to have prevented pro-ethanol interest groups from achieving the overwhelming balance of power. In early 2000, however, the widespread controversy created by MTBE water contamination appears to have provided ethanol proponents with a new opportunity to bargain with traditionally anti-ethanol interest groups.

### 5.3 Government in the Policy Stream

Two U.S. federal agencies played a particularly important role in generating ideas within the policy stream. The following sections will discuss the role of the United States Department of Agriculture and the Environmental Protection Agency.

#### The United States Department of Agriculture

The United States Department of Agriculture (USDA) has a long history of involvement in the ethanol debate. The rise in the USDA's visibility within the policy stream coincided with the rise in the cost of the agricultural price support scheme in the early 1980s. According to Johnson et al. (2000, 22), it was during this period that the USDA began to consider ethanol as way of "camouflaging farm program costs and facilitating the channelling of funds to corn producers".

Interestingly, the first major cost-benefit study, released by the USDA in 1986, at the height of concern about the size of agricultural deficiency payments, was very critical of ethanol. Undertaken specifically to address the question of whether "a positive trade-off existed between price support program costs and the ethanol subsidies, the study utilised a general equilibrium approach to estimate the non-environmental benefits and costs of the subsidy" (Johnson et al. 2000). The USDA Office of Energy, which conducted the investigation, found that "ethanol production could not survive through 1995 without massive Government subsidies, given the outlook for petroleum prices"<sup>19</sup> (Libecap 2003, 94). Moreover, the USDA suggested that "if the principle argument for subsidizing ethanol is to boost farm income, we conclude from this analysis that it would be more economical to burn straight gasoline in our automobiles and pay corn growers a direct subsidy equal to the amount they would receive as a result of ethanol production" (Libecap 2003, 94).

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<sup>19</sup> For the full findings of the report see Gavett, E., Grinnell, G, and Smith, N. 1986. 'Fuel Ethanol and Agriculture: An Economic Assessment', *Agricultural Economic Report 562*, U.S. Department of Agriculture, Office of Energy, Washington, D.C, Government Printing Office.

Not surprisingly, many of ethanol's supporters responded unfavourably to the report. Immediately after the release of the report, many ethanol proponents began actively working to discredit its findings. Others went a step further and demanded for the dismissal of Earle Gavett, Director of the USDA Office of Energy, and one of the authors of the report. As a result of proponent pressure, Edmund Lyng, Secretary of Agriculture, agreed to have another study carried-out. Senator Robert Dole of Kansas also arranged to have an amendment added to the *Farm Disaster Assistance Act* (1987) requiring the Secretary of Agriculture to establish a seven-member panel, largely made up of industry representatives, to conduct an analysis of cost-saving technology (Libecap 2003, 94). Subsequently, the newly formed panel, which included Earle Gavett, made recommendations for another study to be conducted, this time by the Economic Research Service (ERS) of the USDA (Johnson et al. 2000).

The ERS was charged with "examining state-of-the-art plants" to determine whether new technology would reduce ethanol's costs and the costs of farm deficiency payments (Libecap 2003, 94). While the previous Office of Energy report had already concluded that any farm program savings would not offset the costs of the ethanol subsidy, it appears that it was largely left to the authors of the ERS study to determine whether or not this outcome might be reversed (Johnson et al. 2000). In 1988, the final version of the ERS study concluded "with ethanol production reaching 2.7 billion gallons by 1995, corn prices would increase to such an extent that there would be net savings to government"<sup>20</sup> (Libecap 2003, 94). In addition to this finding in favour of the continuation of the ethanol subsidy, the 1988 study also marked the first major report in which the USDA began to promote the environmental benefits of ethanol. While there appears to have been some ambiguity surrounding exactly what those benefits were, this was a departure from the earlier Office of Energy report, which focused solely on the economics of ethanol production.

Since the 1980s the USDA has issued a series of reports emphasising the environmental, energy security and rural development benefits of ethanol. Most of these reports have emphasised the increased viability of ethanol due to technological innovations both in terms of farming practices and ethanol production. For example, in July of 2002, the USDA released a study entitled "The Energy Balance of Corn: An Update" that focused on the net energy balance of ethanol. The report, authored by Hosein Shapouri and James Duffield of the USDA Office of the Chief Economist, and Michael Wang of Argonne National Laboratory, concluded that the production of ethanol: "yields 34 per cent more energy than it takes to produce it, including growing the corn, harvesting it, transporting it, and distilling it into ethanol" (Shapouri et al. 2002, iii).

The report also found that the increasing efficiency of ethanol production was due in large part to advances in technology that had been adopted by "most ethanol plants in production today"

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<sup>20</sup> For the full findings of the ERS report see Leblanc, M and Reilly, J. 1989. 'Ethanol: Economic and Policy Tradeoffs', AER-585, U.S. Department of Agriculture, Resources and Technology Division, Washington, D.C, Government Printing Office.

(Ibid.). The authors contended that advances in crucial areas such as fertiliser production, fuel conversion, and corn harvesting meant that ethanol's value as a net energy producer had "improved significantly over the past 20 years" (Shapouri et al. 2002, iii).

Another USDA study, released in August 2002, anticipated effects of the Renewable Standard (RFS) as proposed in the *Energy Policy Act of 2002* (S.517).<sup>21</sup> At the request of Senator Tom Harkin of Iowa, USDA carried out the study to examine how the proposed RFS would affect commodity markets, farm income, and employment. As is was laid out in the 2002 Senate energy bill, the RFS would have ensured the creation of a five billion gallon per year market for renewable fuels over the subsequent ten-year period. According to that report, the effects of the increase would be beneficial on a variety of levels. It was expected that increased ethanol production would be followed by increased demand for corn, and by 2011: "prices would be up about 13 cents per bushel or 5 per cent" (EESI 2003, 6). Increased demand for ethanol would have a positive impact on net farm income, with an estimated increase of \$700 million per year during the period 2006-2011 (Ibid.). The study also reiterated the benefits of an increased ethanol market in terms of employment, estimating the creation of 13,500 jobs in the U.S. (Ibid.).

In addition to its prominent role in the development and dissemination of information, the USDA also used agricultural legislation to create renewable energy policies and programs aimed at stimulating the ethanol market. In the late 1990s, energy became an explicit policy goal of farm programs via a provision in the USDA's *FY2000 Appropriations Act*. The provision authorised establishment of pilot projects for harvesting biomass on lands set aside for crop production under the Conservation Reserve Program (CRP). In 2000, the USDA also initiated a Commodity Credit Corporation (CCC) Bioenergy Program to stimulate demand and alleviate crop surpluses "which were contributing to low crop prices and farm income, and to encourage new production of biofuels" (Duffield et al. 2006, 12).

Title III of the *Agricultural Risk Protection Act of 2000* (ARPA), the *Biomass Research and Development Act*, also directed the Agriculture and Energy Secretaries to cooperate and coordinate policies to "promote the research and development of bioproducts". In particular, Title III: "established a biomass research and development initiative that authorized financial assistance for public and private sector entities to carry out research on bioproducts" (Duffield et al. 2006, 12). However, the most significant piece of legislation was the Farm Bill of 2002, which contained the first energy title in Farm history. Title IX created a range of programs to promote bioenergy and bioproduct consumption through to the year 2007.

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<sup>21</sup> For a detailed discussion of S.517 see Bamberger, R. 2002. 'Energy Policy: Setting the Stage for the Current Debate', Congressional Research Service report, from [fpc.state.gov/documents/organization/9065.pdf](http://fpc.state.gov/documents/organization/9065.pdf)

## The Environmental Protection Agency

Like the USDA, the Environmental Protection Agency (EPA) has a long history of involvement with ethanol. Indeed, the first environmental policy to have a major effect on ethanol was the EPA-designed *Clean Air Act Amendments* of 1990 P.L. 101-549 (CAA). Developed in response to persistent environmental concerns regarding air quality, CAA provisions established the Reformulated Gasoline Program (RFG) and the Oxygenate Fuels Program in an attempt to control carbon monoxide and ozone problems (Duffield 2006, 11). Under the RFG program, areas with “severe” or “extreme” ozone pollution were required to use gasoline containing at least two per cent oxygen by weight (McCarthy 2000, 3-4). Although most refiners chose to meet the oxygenate requirement by blending MTBE, the EPA initiated provision did serve to stimulate the ethanol market.

In 1994, the EPA implemented additional regulations requiring 30 per cent of the oxygen mandated by the CAA (1990) to be derived from renewable feedstock, most of which would be ethanol<sup>22</sup> (EPA 1994, 1). The United States Court of Appeals for the District of Columbia reversed the EPA’s Renewable Oxygenate Rule (ROR) in 1995, on the grounds that it exceeded the agency’s authority. However, administrative actions taken by the EPA demonstrate the agency’s willingness to implement rulings favourable to ethanol.<sup>23</sup> Indeed, prior to the overturning of the rule, the EPA promoted the ROR, not only on the grounds of potential air quality benefits, but also for several non-environmental reasons. For instance, in a statement made to Congress at a hearing to discuss the ROR, EPA Administrator Carol Browner emphasised not only the environmental benefits the rule would have in terms of reducing greenhouse gas emissions, but also the resulting gains to farmers and the rule’s ability to reduce oil imports (Johnson et al. 2000).

Another aspect of the EPA’s role in the policy community concerns its efforts to phase out MTBE. The Agency issued a drinking water advisory in December 1997, in response to reports of possible MTBE contamination of ground water (EPA, 1997). During this period the EPA became involved in a variety of studies aimed at finding a replacement for MTBE, and provided \$15 million in research funds in 1998 alone (Perciasepe, U.S. 106th Cong., 2000, 41-48). Arguably the most prominent of the studies the EPA was involved in the wake of the MTBE water contamination controversy was that issued by the newly created Blue Ribbon Panel.<sup>24</sup> Charged

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<sup>22</sup> See Federal Register 39258, 1994. “See also, Committee on Toxicological and Performance Aspects of Oxygenated Motor Vehicle Fuels, Board on Environmental Studies and Toxicology, Commission on Life Sciences, National Research Council, *Toxicological and Performance Aspects of Oxygenated Motor Vehicle Fuels*, Washington D.C.: National Academy Press, 1996, 4” (Libecap, 2003).

<sup>23</sup> See ‘American Petroleum Institute and National Petroleum Refiners Association v United States Environmental Protection Agency and Carol M. Browner, Administrator, United States Environmental Protection Agency’, United States Court of Appeals for the District of Columbia, April 28, 1994, 94-1502.

<sup>24</sup> The Blue Ribbon Panel was comprised of leading experts from public health and scientific communities, water utilities, environmental groups, and local and state government.

with reviewing the use of MTBE and other oxygenates, the Blue Ribbon Panel report recommended a significant reduction in the use of MTBE, and an amendment to the *Clean Air Act* that would remove the requirement that reformulated gasoline contain 2 per cent oxygen.<sup>25</sup>

Despite the recommendations of the Blue Ribbon Panel, the EPA remained a strong supporter of replacing MTBE with ethanol in RFG. The EPA recommend a phase-out of MTBE over a period of several years, while retaining the 2 per cent oxygenate requirement on the grounds of its “proven success in reducing smog levels or ozone levels” (Perciasepe, U.S. 106<sup>th</sup> Cong., 2000, 45). A review of the records show the EPA to have been present at most, if not all, congressional hearings held to discuss the issues of MTBE water contamination, the CAA, RFG, and alternative fuels and fuel additives during 1999 to 2004 (106<sup>th</sup>-108<sup>th</sup> Congresses).<sup>26</sup> EPA representatives stressed the importance of the retention of the role of ethanol, declaring the EPA to be “committed to working with Congress to provide a target legislative solution that maintains our air quality gains and allows for the reduction of MTBE, while preserving the important role of renewable fuels like ethanol” (Perciasepe, U.S. 106<sup>th</sup> Cong., 2000, 48).

In addition to the EPA’s visibility in providing feedback to policymakers about MTBE water contamination, the agency also played a central role in denying several state applications for an exemption from the RGF’s oxygen requirement. At the height of MTBE water contamination concerns, California Governor Gray Davis had ordered the phase-out of MTBE gasoline blends by December 2002. However, these concerns subsequently raised doubts amongst members of the petroleum industry about the practicality of relying upon ethanol as the sole oxygenate in California. Specifically, petroleum distributors expressed doubts regarding the availability of the anticipated 580 million gallons of ethanol that would be needed in California and the effects the transition might have on gas prices (EESI 2003, 6-7). In response to these concerns, Davis requested a waiver from the EPA that would have exempted California from meeting the federal oxygenate requirement (McCarthy 2000, 3-5). However, in June 2001 the EPA denied the request, justifying its decision as a means of avoiding “a confusing patchwork of state rules” (McCarthy et al. 2005, 22).

Chevron Texaco subsequently announced that it would join several other major refiners in voluntarily phasing out MTBE in advance of the California deadline (EESI, 2003). As the largest oil and natural gas producer in the state, Chevron Texaco’s announcement made it clear to

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<sup>25</sup> The full Blue Ribbon Panel report ‘Achieving Clean Air and Clean Water: The Report of the Blue Ribbon Panel on Oxygenates in Gasoline’, can be found at <http://www.epa.gov/oms/consumer/fuels/oxypanel/r99021.pdf>.

<sup>26</sup> See U.S. Congress. House. 2000. Committee on Commerce. Health and Environment Subcommittee. ‘Hearing on National Implementation of the Reformulated Gasoline Program’, 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., March 2, 2000, 41-48; U.S. Congress. House. 2001. Committee on Environment and Public Works. Clean Air, Climate Change, and Nuclear Safety Subcommittee. ‘Hearing on *Clean Air Act*: Alternative Fuels and Fuel Additives’, 108<sup>th</sup> Cong., 1<sup>st</sup> Sess., march 20, 2003, 6-9. Holmstead, J. U.S Congress. House. 2001. Committee on Energy and Commerce. Oversight and Investigations Subcommittee. November 1, 2002.

policymakers that major oil refiners did have the institutional capacity to make the transition from MTBE to ethanol: “We’ve made good progress with meeting the many difficult logistical, technical and permitting challenges that must be overcome to remove MTBE state-wide” (RFA 2003, 7). Several other oil refiners also made statements to affirm their commitment to replacing MTBE blends with ethanol (RFA 2003, 7).

The EPA has been a strong supporter of a Renewable Fuels Standard (RFS) in lieu of an oxygenate requirement under the RFG provision of the CAA (1990). In 2000, EPA Administrator Carol Browner and Agriculture Secretary Dan Glickman appeared together at a press conference to call on Congress to “require the use of ethanol in *all* gasoline” (McCarthy 2000, 5). The EPA also appeared at many of the congressional hearings held to discuss the establishment of a RFS that would repeal the CAA’s oxygenate requirement. In a statement made to Congress EPA, representative Jeffrey Holmstead emphasised the agency’s support of legislation (such as that introduced by Senator Tom Daschle, S.385) that would replace the RFG with a RFS: “legislation [that] would have maintained the environmental benefits of the reformulated gasoline program, known as the RFG program, prevented backsliding in air toxics, removed RFG oxygenate mandate, imposed a Federal phase-out of MTBE, and created a national renewable fuels standard. The [EPA] Administration wants to reaffirm its support of legislation such as S.385 that is consistent with this approach” (Holmstead, U.S. 108<sup>th</sup> Cong., 2003, 6-7).

In brief, the EPA and USDA have both been highly visible actors in the policy stream. The USDA has played a central role in developing and disseminating industry information, and providing feedback to policymakers about the status of the industry. This was particularly true with regard to technical innovations and practices in agriculture and ethanol production, which the Agency claimed would enhance the feasibility of ethanol in the U.S. The USDA has discredited studies disputing the viability of ethanol, and has emphasised the benefits the industry provides to farmers. Over the years, however, the USDA extended these arguments to emphasise the wider societal benefits of ethanol, in an attempt to appeal to the population outside of its narrower agricultural constituency (Johnson et al 2000).

Many of the EPA’s actions also had a profound effect on the development and reformulation of the ethanol idea. While these actions do not always appear to have been carried out in a direct attempt to promote ethanol, many have nonetheless had this effect. It has increasingly prescribed ethanol as an important part of the expansion of renewable energy in its many appearances at hearings during the 105<sup>th</sup> and 106<sup>th</sup> Congresses. The EPA’s role in the policy community has also involved providing policymakers with critical feedback on the operation of existing programs, such as the CAA. Therefore, while sometimes appearing to act under considerable pressure from outside interests, the USDA and the EPA were important members of the policy community.

### 5.3 The Scientific Community

According to Kingdon (1995, 53), the collection of academics, scientists, researchers, and consultants is the second most important set of non-governmental actors behind interest groups. While not overtly powerful in terms of the influence they have on the agenda, the scientific community does play an important role in the generation of ideas (Ibid. 54).

As U.S. dependence on non-renewable resources came to be recognised as a threat to the nation's security, economy and environment, members of the scientific community embarked upon a series of studies assessing the feasibility of various alternative energies. In the wake of the oil shocks of the 1970s, attention turned increasingly towards ethanol as an alternative liquid fuel for the nations' growing vehicle fleet.

However, given the complex and highly technical nature of the subject matter, there is little evidence to suggest a high degree of consensus amongst the scientific community. Moreover, the complex range of factors that must be considered to produce comprehensive cost-benefit or impact analyses resulted in the involvement of an enormous number of experts from a range of different domains. The vast volume of information produced by this community has made the task of deciphering this information a difficult one. Providing a comprehensive analysis of all scientific input is beyond the scope of this paper. However, the remainder of this chapter will provide a brief overview of three of the issues where the scientific community has been most visible: (1) the net-energy balance of ethanol, (2) ethanol's impact on air quality and the environment, and (3) the feasibility of cellulosic ethanol.

The net-energy balance of ethanol is an issue that has attracted much attention from the scientific community. The 'net-energy balance' of ethanol (NEV) is determined by taking the amount of energy contained in a gallon of ethanol (roughly 76,000 btu) and subtracting the amount of energy required to produce a gallon of ethanol. Research dedicated to examining ethanol's NEV was available throughout most of the period under consideration (1970-2005). An examination of some of the most prominent studies produced during this period shows a discernable upward trend toward the positive energy-return end of the spectrum. During earlier years, however, many studies found ethanol production to result in net-energy losses, or at best 'negligible' net-energy gains<sup>27</sup>.

Perhaps most prominent among the researchers who concluded ethanol production required more fuel than it produced was David Pimentel, Professor Emeritus at the Department of Entomology at Cornell University. Pimentel published a series of studies that rebuked claims about ethanol's potential to offer net-energy gains (1991, 2001, 2003, 2005). Pimentel's 2005 study, co-authored with UC Berkeley Professor Tad Patzek, and entitled *Ethanol Production using Corn*,

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<sup>27</sup> Several studies that reported negligible gains or losses during this period include: (Chambers et al., 1979; Ethanol Study Committee, 1979; ERAB, 1980, 1981; GAO, 1990; Pimentel, 1991).

*Switch Grass and Wood*, reported “corn ethanol requires 29 per cent more fossil energy than the fuel produced... Ethanol production in the United States does not benefit the nation’s energy security” (Pimentel et al. 2005, 65-66). Both opponents and proponents of ethanol have cited Pimentel’s studies widely. For example, in an attempt to discredit Pimentel’s 2001 study *The Limits of Biomass Energy*, the NCGA issued the report *Comparison of USDA and Pimentel Net Energy Balances* (2001) that stated:

“The USDA analysis clearly shows, contrary to the Pimentel paper, that US farming and ethanol manufacture are very energy efficient, and that the energy content of ethanol delivered to the consumer is significantly larger than the total fossil energy inputs required to produce it. USDA estimates that ethanol facilities produce at least 1.23 units of energy as ethanol for every fossil btu included. Considering all energy inputs related to corn farming, corn transport, ethanol production, and distribution and transport of finished ethanol” (NCGA 2001, 4-5).

Conversely, several highly visible members of the scientific community have found ethanol to have a significant net-energy gain (Lorenz et al., 1995; Graboski, 2002; Sheehan et al., 2004, Dale et al. 2005). One particularly visible proponent of ethanol’s positive net-energy balance is Michael Wang of the Centre for Transportation Research at the Argonne National Laboratory. In 1995, Wang developed the ‘GREET’ model to aid in the assessment of the energy potential of a range of fuels. GREET is a lifecycle model for transportation fuels and vehicle technology, and has been used by Argonne since 1997 to evaluate fuel ethanol’s energy and emission effects. In conjunction with several co-authors, Wang conducted a series of detailed analyses on energy and emission impacts of corn ethanol from 1997 to 2005 (Wang et al., 1997, 2001, 2005). Since the late 1990s, Wang has also been involved in a number of joint studies between the Department of Energy (USDOE) and the USDA, all of which found a positive energy gain (Shapouri et al 2002; Shapouri et al. 2003).

The joint USDA-USDOE studies’ findings are also consistent with additional research conducted by Dr. Bruce Dale of Michigan State University. Dale’s 2002 study found as much as a 56% net-energy gain from every gallon of ethanol produced, stating: “The available energy from ethanol is much higher than the input energy for producing ethanol. In other words, using ethanol as a liquid transportation fuel would significantly reduce domestic use of petroleum even in the worst-case scenario” (Dale et al. 2002, 242-243). An ethanol net-energy gain has also been confirmed by a number of other scientific assessments conducted by the Colorado School of Mines, the Minnesota Department of Agriculture, the Institute for Local Self-Reliance and several other public and private entities.

The considerable attention the ethanol NEV issue continued to garner within the scientific community well into the mid-2000s was not reflected in Congress. A review of multiple

congressional hearings held to discuss ethanol from 2000 to 2005 shows minimal discussion directly related to ethanol's NEV. This suggests some degree of consensus surrounding ethanol's value as a positive-net-energy contributor may have been achieved within policy circles. Nevertheless, a broader discussion regarding ethanol's capacity to contribute to the nation's energy security was debated well into the 2000s. Most often, however, energy security was discussed in conjunction with several additional benefits, including environment and the rural economy. This is exemplified by the testimony of two well-known experts, Dr. Brian Donnelly, the Executive Director of University Park in Illinois, and Dr. Donald Holt, the Associate Dean of Agriculture, Consumer, and Environmental Science at the University of Illinois. At a Congressional hearing to discuss ethanol in 2000, both expert witnesses testified in favour of ethanol, which they argued would help ease energy security problems, revive the rural economy, and reduce on-going environmental degradation caused by fossil fuels (Donnelly, U.S. 106<sup>th</sup> Cong. 2000, 1-121).

Another reason for the peripheral status of ethanol's NEV in congressional hearings from 1999 to 2005 was the priority placed on MTBE water contamination and assessing the environmental and health benefits/impacts of potential replacement fuels. From 1998 to 2005, members of the scientific community undertook a number of studies aimed at assessing the health, air, and water quality impacts of ethanol. The California Air Resources Board (CARB) at the request of Governor Gray Davis carried out one particularly prominent peer-reviewed study. The CARB was charged with assessing the environmental impact of ethanol on air, surface water, and groundwater (CARB 1999, 1). After extensive testing, the CARB concluded there might be better alternatives for reducing vehicle emissions (including carbon monoxide) than ethanol or oxygenate additives in general (CARB 1999).

However, studies conducted by the EPA and the USDA found an average 15 per cent reduction in carbon monoxide (CO) emissions for gasoline blended with 10 per cent ethanol (E10), compared to gasoline without ethanol (Naidenko, 2010). A review of several other prominent studies conducted by a variety of public and private entities reveals that some sort of tentative consensus may have been achieved regarding ethanol's ability to reduce CO emissions. However, during 2000 to 2005 multiple studies also reported higher emissions of the hazardous air pollutants acetaldehyde and formaldehyde (Pimentel et al. 2005; Winebrake et al. 2001). Commonly referred to as volatile organic compounds (VOCs), acetaldehyde and formaldehyde are both considered by the EPA to be strong respiratory irritants, and probable human carcinogens (EPA, 2007).

The lack of consensus achieved within the scientific community on ethanol's environmental impacts was also reflected in Congress. From 2000 to 2005 (during the 105<sup>th</sup>-109<sup>th</sup> Congresses), a wide array of experts, proponents, and opponents cited different research to support their respective positions. However, much of the research referred to emphasised the trade-offs involved in ethanol's expanded use. This theme can be seen in the testimony of Dr. Blake Early, environmental consultant for the American Lung Association, at a congressional hearing held to

discuss the environmental aspects of ethanol. At the hearing Early emphasised the environmental benefits of ethanol, highlighting the additives contributions to reducing CO emissions (Early, U.S 106<sup>th</sup> Cong. 2000, 13). However, he also cited several other studies, including one by the National Research Council (NRC). The NRC report, while also finding evidence to support ethanol's ability to reduce CO and carbon dioxide (CO<sub>2</sub>) emissions, found the use of ethanol to have the potential to increase other harmful emissions such as VOCs and Nitrogen Oxide (NO<sub>x</sub>) (Ibid.). Ultimately, no comprehensive scientific consensus appears to have been reached on a number of issues central to the on-going debate over ethanol's environmental impact.

Much of the scientific community, however, was more optimistic about the potential of cellulosic ethanol in improving environmental quality and energy security (Greene et al, 2004; Shapouri et al., 2003; Lynd, 1996). A vast quantity of literature has been produced that assesses the viability of cellulosic ethanol. The majority of studies (even those critical of corn ethanol) have found cellulosic ethanol to be promising on a number of grounds, including higher energy returns, lower agricultural inputs, and less negative environmental impacts. For instance, one prominent study conducted by the Argonne National Laboratory reported cellulosic ethanol to have the potential to reduce greenhouse emissions by up to 85 per cent compared to corn based ethanol (E10) (Wang, 2005).

Many members of the scientific community also argued an ethanol mandate would provide the necessary platform to reach the goal of more efficient cellulosic ethanol. This was expressed by Mark Mazour, Director of Office Policy at the USDOE:

“As you know, the major renewable fuel used in this country today is ethanol from the starchy parts of corn kernels. Corn ethanol production is approximately 1.5 billion gallons a year, representing about 1 per cent of the energy of our annual gasoline consumption. To complement this production, The Department of Energy is engaged in a long-range research program to develop ethanol derived from cellulosic matter, including agricultural and forest residues, the organic components of municipal solid waste, and future energy crops such as fast-growing grasses and trees” (Mazour, U.S 106<sup>th</sup> Cong. 2000, 25).

Despite the enthusiasm surrounding the multiple benefits of cellulosic ethanol, the high cost of production cast considerable doubt on its near-term viability. In 2005, the USDOE estimated the cost of producing 1 gallon of cellulosic ethanol at \$2.20, nearly twice the 2005 cost of producing the equivalent amount of corn-ethanol. However, the USDOE also expressed the hope that this would be reduced to \$1.07 per gallon by 2012 (Houghton et al., 2005).

To summarise, although there is much evidence of a high degree of scientific input in the policy stream, it is difficult to gauge the effect it had on policymakers. The scientific community has been highly visible in debates over issues regarding ethanol's energy content, a variety of environmental

issues, and the technical feasibility of cellulosic ethanol. However, due to the complexity of these issues, equally credible scientifically supported arguments were made both in support of and against the use of ethanol. As such, the ideas generated in the scientific community may have been less important than Kingdon suggests. Nevertheless, despite the high level of fragmentation within the scientific community, certain trends have emerged. For instance, some degree of consensus was achieved amongst experts about ethanol's ability to reduce CO emissions. However, the trade-offs involved in achieving this reduction were also widely acknowledged. There was also an upward trend in research that found a positive-net-energy return from ethanol production.

In its entirety, members of the policy stream have been extremely active in assessing the viability of the ethanol idea against a set of evolving criteria. However, these efforts appear to have increased exponentially since the early 1990s. Consistent with Kingdon's framework, the ideas presented within the policy stream have undergone a complex process of recombination. In this regard, the ethanol policy stream did indeed appear to resemble what Kingdon describes as a "policy primeval soup". The most important and visible members of the policy community's ideas have come from two federal agencies: the USDA and the EPA. A wide range of scientists and academics has further informed those ideas.

Interest groups also played an important role in generating ideas and applying pressure in the policy stream. While several of these groups might also be identified as policy entrepreneurs, their activities have already been discussed and thus will be excluded from the following chapter. The next chapter identifies the most important policy entrepreneurs whose efforts were instrumental in 'softening-up' the system and linking the streams. The chapter will begin, however, by reviewing the political conditions as they presented themselves within the political stream during the 2000 to 2005 time period.

## CHAPTER 6: THE POLITICAL STREAM

As previously noted, Kingdon argues that the political stream has a powerful effect on the content of governmental agenda. “Quite apart from what happens in the policy community and quite apart from bringing problems to the attention of people in and around government, the potential for placement of an item on the agenda is highly dependent on favourable political conditions” (Kingdon 1995, 145). Assessments are generally based on important actors’ perceptions as to whether the balance of factors in the political stream favour action. According to Kingdon, these perceptions are the result of the sum of various political conditions such as the prevailing national mood, the balance of organised political forces/interests groups, and change of key personnel at the administrative and executive levels. It is the perceived presence of favourable conditions informed by these key elements that ultimately determines the likelihood of an item being pursued, or alternatively, ‘shelved’ until a “more prosperous time” (Ibid.).

### 6.1 Political Conditions

The examination of the case of ethanol indicates the presence of all three of the factors Kingdon suggests create favourable political conditions, the national mood being a significant one. Indeed, several of the issues supporters of ethanol attempted to present ethanol as a solution to resonated highly with the general public from 2000 to 2005. For example, a Gallup poll conducted in 2001 reported almost half of Americans to be “personally worried” about the nation’s energy security, and that these worries “rank[ed] fairly high” among other issues tested in the survey (Sadd, 2001). While this percentage was lower than the 58 per cent recorded in 2001 during the height of the West Coast energy shortage, it was similar to results of polls conducted during the 1979 energy crisis, which recorded 41 per cent of people as worried. The level of public concern about the nation’s energy supply also appears to have remained high through to 2005. An opinion poll conducted in 2005, three months before the passage of EPAAct 2005, found that 41 per cent of Americans continued to regard the energy situation as “very serious” (Sadd, 2006).

Polls also indicated a high level of concern about the environment. Reflecting the environmental renaissance that began in 1990, concern appears to have spiked in 2001 with 77 per cent of the surveyed public reporting to be “worried” about the environment. Despite a reduction in public concern after 2001, polls indicate that public attitude toward the environment remained relatively steady with the percentage of people who worried “a great deal” or “fair amount” fluctuating between 62 and 68 per cent between 2000 and 2005 (Sadd, 2005). According to Gallup’s March 2005 environmental poll, slightly more than half of American’s (53 percent) also thought that protecting the environment should be given priority “even at the risk of curbing economic growth” (Carlson, 2005).

Early-to-mid 2000 was also a period in which the public was very supportive of alternative fuel ideas, as reflected in several public polls conducted during 2000 to 2005. For example, a Gallup poll carried out in 2001 found widespread support for investment in the nation's energy infrastructure, including "near-universal support for development of alternative energy sources, including solar, wind, biofuel [ethanol], biodiesel, and fuel cell technology" (Sadd, 2001). The findings of this Gallup poll were corroborated by a number of other reports. For instance, a Zogby International (2001) survey reported "most Americans believe that government should explore alternative energy sources rather than spend money seeking out more oil and gas reserves". The survey of 1199 people nationwide revealed 66 per cent of Americans thought the U.S should seek out alternative sources of energy and fuel, while only 24 per cent thought more money should be spent on oil and gas exploration (Ibid.). The importance the public placed on developing alternative sources of fuel also appears to have remained high up until 2005. For example, a 2005 Gallup poll reported: "widespread public support for proposals that involve government spending to develop new energy sources with 85 per cent saying they favoured spending government money to develop alternate sources of fuel for automobiles" (Jones 2006).

While opinion polls provide some anecdotal evidence of the public mood, there is also evidence to indicate that policymakers recognised the presence of favourable political conditions for ethanol. In Congress, concern about the environment and energy was increasingly voiced in ways that justified the implementation of policy that would expand ethanol's role within the U.S. For example, Senator James Inhofe of Oklahoma declared in the *Congressional Record* that:

"Americans demand from us the enactment of a comprehensive energy policy, the likes of which we have never seen before...Today we have a golden opportunity to have an energy policy for the United States of America. It has to be a policy that harmonizes energy and environmental policies, acknowledging that the economy and the environment are vitally intertwined. Ethanol is a central part of this" (Inhofe, 2002).

Recognition of a favourable political climate was also reflected in a statement by Congressman John Shimkus of Illinois, before the Committee on Agriculture, Nutrition, and Forestry, to discuss MTBE and the future of biofuels "in my tenure as a member of Congress I have never seen a better climate to increase the use of ethanol than we have here and now. We really do need to strike while the iron is hot" (Shimkus, U.S. 106<sup>th</sup> Cong. 2000, 5).

Another factor that contributed to favourable political conditions for ethanol was the increasing level of cohesiveness exhibited amongst interest groups. While ethanol has long possessed a large natural constituency due to its wide-variety of stakeholders, the evolution of cohesiveness amongst proponents since the 1970's has been remarkable. An example of this cohesiveness is exhibited in the formation of the coalition known as the Renewable Fuels Association (RFA). Formed in 1981,

the RFA developed into a particularly powerful and vocal organisational force for the diverse interests that supported and promoted ethanol by 2000.

Another example of the high level of cohesion is demonstrated by the formation of the Governors' Ethanol Coalition in 1991. The coalition served to coordinate the efforts of some 27 U.S. governors, all of whom sought to "shift the nation's dependence from imported oil and MTBE to domestic sources, including ethanol" (Governors' Ethanol Coalition, 2004). As previously demonstrated, there was also a high level of coordination and cooperation exhibited between some of the major and minor interest groups. Therefore, although the strategies employed by organised political forces diverged in several areas, overall, the groups were increasingly able to present a united front with only small number of representatives speaking on behalf of the numerous smaller groups.

An increasing level of consensus was also achieved amongst pro-ethanol interests with regards to the *form* they sought ethanol legislation to take. By 2000, the implementation of a RFS that would mandate that ethanol be blended into the nation's gasoline supply was widely supported as the ideal outcome. An example of the level of consensus can be seen at a congressional discussion in 2002 where one Senator submitted for the record 12 letters from farming constituents and other organised interests recommending the passage of a "meaningful" RFS (Lincoln 2002, 1817-1820).

The superior level of group cohesion exhibited by ethanol interests was, on the other hand, met by an increasingly fragmented and unpopular oppositional force.<sup>28</sup> The conflict between well resourced and highly vocal MTBE producers and distributors was increasingly evident during the 2000 to 2005 period.<sup>29</sup> Indeed, the balance of organised forces that had previously militated against the widespread advancement of the ethanol idea amongst policymakers had somewhat weakened by early 2001. Therefore, while consensus amongst both opponents and proponents of ethanol about the need to address the energy and environmental crises had been achieved by early 2000, the lack of cohesively specified opposition on several key policy issues related to ethanol appears to have hindered these groups from gaining additional political support.

Another factor that appears to have contributed to favourable political conditions for ethanol was the 2001 presidential elections. In the years preceding the 2001 elections, George W. Bush campaigned strongly in support of ethanol. On a campaign tour through Iowa in 1999 (a state perceived as an early presidential testing ground) Bush is recorded as having spoken out in favour of ethanol, among other things describing ethanol as being "good for the air quality of America".

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<sup>28</sup> For an example of allegations that the petroleum industry knew about the potential for MTBE to contaminate water sources as early as 1995, see U.S. Congress. House. 2003. Committee on Energy and Commerce. Energy and Air Quality Subcommittee, 'Hearing on Comprehensive National Energy Policy', 108<sup>th</sup> Cong., 1<sup>st</sup> Sess., March 5, 12 and 13, 2003, 456-465.

<sup>29</sup> For an example of the divergent positions of the major petroleum trade associations, see U.S. Congress. House. 2003. Committee on Energy and Commerce. Energy and Air Quality Subcommittee, 'Hearing on Comprehensive National Energy Policy', 108<sup>th</sup> Cong., 1<sup>st</sup> Sess., March 5, 12 and 13, 2003, 431-434; 435-443.

The recognition of Bush's support for ethanol was widely reflected in a number of articles. One particularly poignant article published in *The Washington Post* described him as "The Ethanol Candidate" (*The Washington Post* 1999, 22).

Additional evidence of the Bush Administration's support of ethanol was seen in 2001 following the release of the President's National Energy Plan, which advocated the use of federal programs to promote alternative fuels including ethanol and biodiesel to help reduce U.S. reliance on petroleum-based fuels (Duffield et al. 2006, 9). Evidence of the Administration's favourable outlook on ethanol also became readily apparent during congressional hearings and discussions. During a congressional discussion in 2002, for instance, Senator Chuck Hagel of Nebraska stated that: "During a recent stop to the Midwest, President Bush proclaimed the promise of renewable fuels, saying Renewable fuels are gentle on the environment, and they are made in America so they cannot be threatened by any foreign power. Ethanol and biofuels are fuels of the future for this country. The President is right" (Hagel 2002, 1807).

Political conditions amenable to the implementation of favourable ethanol policy were further enhanced by the 2004 presidential election campaigns. The closeness of the presidential race between George W. Bush and John Kerry gave added potency to the ethanol position as an important campaign issue. Ethanol's political clout during this period stemmed from the need of each candidate to secure the vote of the 'swing states'. As many of these states were major producers of corn, as well as being home to many of the ethanol production facilities, both candidates campaigned strongly in favour of ethanol in order to appeal to these constituencies. Various articles published during this period noted the particularly favourable political conditions for ethanol that had been expanded by the 2004 elections (Lorenzetti, 2002; New York Times, 2003; Fitzgerald et al., 2004). These articles reinforced the theme expressed in an article published in 2003, which stated: "ethanol is virtually untouchable politically in certain farm states, particularly Iowa and particularly during a presidential election year" (Barrett et al., 2003).

In summary, a review of the literature has revealed the presence of three important factors that contributed to the creation of a favourable political environment for ethanol: (1) a national mood in which several key issues supporters attempted to relate to ethanol resounded strongly, (2) cohesive organised interests, and (3) presidential election campaigns. Further, the evidence suggests that by early 2000 important people in and around government were increasingly aware of the presence of a favourable political climate.

## 6.2 Policy Entrepreneurs

As discussed in Chapter 2, Kingdon argues that policy entrepreneurs occupy an important position within the agenda setting and policy specification process. It is they who invest their (sometimes considerable) resources advocating for a particular position in the hopes of "anticipated future gain in the form of material, purposive, or solidary benefits" (Kingdon 1995, 179). Policy entrepreneurs

are found to be active in all three of the streams. Within the problem stream, these entrepreneurs push their concerns about certain problems higher on the agenda (Ibid. 204). In the policy stream they are active in pushing their pet proposals during the process of softening up the system (Ibid.). In the political stream, policy entrepreneurs also play a critical role in the coupling of the streams when a window of opportunity is perceived to have opened (Ibid. 205).

According to Kingdon, it is nearly impossible to attribute sole responsibility for an item's high agenda status to one specific individual (Kingdon 1995, 179-180). However, there is potential to identify a particular person, or few persons, who were central in moving a subject up on the agenda and into a position for enactment. In the case of ethanol's rise to agenda prominence, many policy entrepreneurs can be found residing in different locations throughout the political system. Although the following list is not exhaustive, it does highlight many of the most visible actors. The list of policy entrepreneurs is based on a review of newspaper articles, press releases, congressional hearings and discussions, and several pieces of secondary literature. Those actors included on the list were highly important in making the couplings between the streams, undertaking numerous softening-up activities in order to promote ethanol to a position on the agenda so that a policy could be enacted.

Carol Browner served as the administrator of the Environmental Protection Agency (EPA) from 1993 to 2001. Browner's tenure at the EPA was the longest served by an administrator in the agency's history, extending through both terms of the Clinton Presidency. Throughout her time at the EPA Browner appeared on numerous occasions to promote the expanded use of ethanol, bio-based products, and other types of bioenergy. In 1994, Browner was one of the driving forces behind the Renewable Oxygenate Rule (ROR), which would have guaranteed ethanol a 30 percent share of the oxygenate market (Johnson et al, 2000). Browner appeared at several congressional hearings to emphasise the gains the rule would create for farmers, and the environment, as well as its ability to reduce oil imports<sup>30</sup> (Ibid.). Browner was also very visible following the concerns raised by the discovery of MTBE in some water supplies, reiterating the Agency's commitment to ethanol and the RFG program.<sup>31</sup>

In the press, Browner was also very vocal, making statements on numerous occasions to promote ethanol-friendly policy. At a 1999 press briefing Browner appeared alongside USDOE Assistant Secretary for Renewable and Energy Efficiency, Dan Reicher, USDA Deputy Chief Economist Joseph Glauber, and Deputy Assistant to the President for Environmental Issues Roger Ballentine, in a show of support for an executive order to encourage the development of alternative

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<sup>30</sup> See Jonathon H. Adler, "Green Pork in the Corn Barrel," Commentary, *The Washington Times*, January 14, 1994. See the chronology in *Hearings on the Environmental Protection Agency's Proposed Renewable Oxygenate Standard*, (1994, p. 8).

<sup>31</sup> For an example of the Statements made by Carol M. Browner U.S. EPA Administrator, on the findings by EPA's Blue Ribbon MTBE Panel, see <http://yosemite.epa.gov/opa/admpress.nsf>.

and cleaner fuels. At the briefing, Browner again emphasised the benefits to farms and farmers, the promotion of environmentally friendly jobs, reductions in air pollution, and protection of public health. She cited the Administration's executive order as proof that a growing economy and a healthy environment need not be mutually exclusive, adding "biomass is to the next century what petroleum was to this century. It is the next generation of fuels and chemicals" (Woolley et al., 1999).

Browner was also a strong promoter of the implementation of a Renewable Fuels Standard (RFS), asserting that the policy would spur development of renewable energy sources. The lasting impression of Browner's policy efforts is also seen in subsequent congressional hearings and discussions, where several people referred to comments or statements she had made as evidence of the viability of ethanol (Feinstein, 2002).

Keith Collins was another important entrepreneur of ethanol-favourable policy. Collins is an agricultural policy expert who served as the U.S. Department of Agriculture's Chief Economist for 16 years from 1993 to 2008. In the last 20 years of his career at the USDA, Collins was one of the most important agricultural economists in agricultural policy and commodity market analysis. He had input into the development of the majority of national agricultural legislation, and USDA proposals for the 1996 and 2002 Farm Bills.

Collins was the main witness brought forward by the USDA at many Congressional hearings and briefings in order to explain the economic implications of ethanol on the USDA and its constituents.<sup>32</sup> Collins has been central in articulating the technical feasibility of an expanded ethanol industry, providing the necessary supporting information to demonstrate the agricultural sectors ability to meet increased demand. In addition to testifying to the rural and national economic benefits of ethanol, Collins has also pointed to several other 'external' benefits of increased ethanol production and use. Collins was particularly visible at hearings held from 2000 to 2005.

Many Senators and Representatives from major corn-growing states were also ethanol policy entrepreneurs. The softening up activities of many corn state Senators and House Representatives extend back to the 1980s. For example, in 1987 legislation that would have allowed ethanol to capture a greater share of the oxygenate market was introduced by Representative

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<sup>32</sup> See 'Statement of Keith Collins Chief Economist, U.S. Department of Agriculture', before the U.S. Congress. House. 2005. Committee on Agriculture. July 21, 2005, available from [http://www.usda.gov/oce/newsroom/archives/testimony/energy\\_tst7-21-05s1.doc](http://www.usda.gov/oce/newsroom/archives/testimony/energy_tst7-21-05s1.doc); Collins, K. U.S. Congress. Senate. 2000. Committee on Agriculture, Nutrition, and Forestry. 'Hearing on The MTBE Crisis and the Future of Renewable Fuels', 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., April 11, 2000, 20-21; Collins, K. U.S. Congress. Senate. 2000. Committee on Agriculture, Nutrition, and Forestry. 'Hearing on Energy and Agriculture', 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., July 20, 2000, 36-37.

Durbin of Illinois and 71 co-sponsors, 43 of whom came from major corn growing states<sup>33</sup>. Many of the representatives provided favourable testimony on the advantages of ethanol in terms of reduced environmental impact and reducing U.S. dependence on foreign oil including, Representatives Alexander (Arkansas), Madigan (Illinois), Durbin (Illinois), Stallings (Idaho), Glickman (Kansas) (Johnson et al. 2000).

Since the 1980s corn state politicians have become increasingly visible in their efforts implement policy that would expand the production and use of ethanol. While providing a comprehensive account of all policy entrepreneurs and their activities is beyond the scope of this paper, several corn state politicians do stand out as having been particularly prominent. One strong entrepreneur of ethanol policy was Bob Dole, who represented Kansas in the Senate from 1969 to 1996. Dole has long been one of ethanol's biggest champions. He not only promoted and helped arrange the original \$3.5 billion tax credit for ethanol (54-cent per gallon), but was also highly visible in his enduring efforts to protect it.<sup>34</sup>

In 1990, Dole helped stall a trade bill until the House agreed to extend the ethanol tax credit and put duties on imported ethanol. During the 1990 Clean Air Act debates and the 1992 national energy strategy debates, Dole can also be seen to have pushed pro-ethanol amendments. In 1991, he added an amendment to a highway bill making it harder for refiners to supply methanol, the chief competitor of ethanol. And in 1993, he lobbied the Bush Administration to issue new regulations that would increase the role of ethanol in government clean air programs. During his time as the 1996 Republican nominee for the U.S. presidential election, Dole also continued to be a strong proponent of favourable ethanol policy, pushing ethanol as a solution to environmental and agricultural economic problems of the day.

Senator Tim Daschle of South Dakota was also ardent entrepreneur of ethanol policy. In 1978, he was elected to the U.S. House of Representatives, where he served for eight years. In 1986, he was elected to the U.S. Senate and eight years later became its Democratic Leader. Daschle was one of the longest serving Senate Democratic Leaders in history, and the only one to serve twice as both Majority and Minority Leader. During his tenure, Daschle was highly visible at numerous congressional hearings and debates, often appearing alongside Senator Dole to emphasize the benefits an expanded ethanol market would have on the farm program and the environment.<sup>35</sup> Often described as having been the leading advocate of ethanol policy, Daschle was increasingly

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<sup>33</sup> See U.S. Congress. House . 1987. Committee on Energy and Commerce. Energy and Power Subcommittee. 'Hearings on H.R. 168, H.R. 1595, H.R. 2031, and H.R. 2052, Bills to Encourage the Replacement of Gasoline with Alternative Fuels', Hearings, 100th Cong., 1st Sess., June 17,24 and July 9, 1987. (Johnson et al., 2000).

<sup>34</sup> For an example, see Dole, B. 1987. *Congressional Record*, Senate, April 23, 1987, p. 93-94.

<sup>35</sup> See U.S Congress. 1993. Senate. Committee on Finance. Energy and Agricultural Taxation Subcommittee. 'Hearing on Alternative Transportation Fuels', 103<sup>rd</sup> Cong., 1<sup>st</sup> Sess., September 29, 1993, 2.

visible at congressional hearings and discussions from 1999 to 2005<sup>36</sup> (Johnson et al. 2000; Libecap 2003). He was also the original author and architect of the Renewable Fuels Standard introduced in 2000 under the Renewable Fuels Act. Daschle's lengthy efforts to strike a consensus amongst policymakers during 2000-2005 were reflected in a statement he made during a 2002 congressional discussion: "It is indeed a testament to the spirit of compromise in the U.S. Senate that all these groups representing often divergent constituencies and interests can come together to create a product that benefits all ... any viable energy strategy must serve a variety of national goals" (Daschle 2002, 1808).

Senator Richard Lugar of Indiana is the U.S Senate's most senior Republican and the longest serving senator in Indiana history. He was first elected to the U.S Senate in 1976 and won a sixth term in 2006 with 87 per cent of the vote (U.S Senate, 2011). Lugar also served as the Chairman of the Agriculture, Nutrition and Forestry committee from 1995 to 2001. As chairman, Lugar was a strong advocate of implementing initiatives to increase farm income, including programs and research initiatives aimed at expanding the ethanol industry (U.S Senate, 2011). A review of congressional hearings and discussions shows Lugar has a highly visible entrepreneur of favourable ethanol policy since the 1980s.<sup>37</sup>

Lugar was also the original sponsor in 2000 of legislation to create a RFS, and has championed the cause of producing ethanol from cellulosic biomass. In 2005 he joined the 'Ethanol Across America Advisory Committee', a non-partisan education campaign of the 'Clean Fuels Foundation'. The Ethanol Across America Committee was a strong advocate of implementing favourable ethanol legislation, in 2005 describing the inclusion of a RFS in the final version of the energy bill as being its "priority issues" (Ethanol Across America Advisory Committee 2005, 1).

In conclusion, although the list provided is in no way exhaustive, there is little doubt that most observers would agree that those identified were highly central in making the links between the streams. Consistent with Kingdon's conceptualisation of policy entrepreneurs, most of these individuals appeared long before the window was opened in 2000. They were all involved in the softening-up process over a number of years and have engaged in a wide variety of activities to promote ethanol. Entrepreneurs have prescribed ethanol as a solution to a number of problems including declining farm income, increasing farm program costs, air quality issues, oil insecurity,

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<sup>36</sup> See Daschle, T. 2002. 'Renewable Fuels Standard' *Congressional Record*, S.1808, 13 March; U.S Congress. House. 1999. Committee on Commerce. Health and Environment Subcommittee, 'Hearing on Reformulated Gasoline', 106<sup>th</sup> Cong., 1<sup>st</sup> Sess., May 6, 1999, 128-129; U.S. Congress. Senate. 2000. Committee on Environment and Public Works. Clean Air, Wetlands, Private Property, and Nuclear Safety, 'Hearing on the Clean Air Act: Environmental Benefits and Impacts of Ethanol', 106<sup>th</sup> Cong., 2<sup>nd</sup> Sess., June 14, 2000, 85-86.

<sup>37</sup> See U.S Congress. Senate. 1994. Committee on Agriculture, Nutrition, and Forestry. Nutrition, and Investigations Subcommittee. 'Hearing on Renewable Oxygenate Rules in the Reformulated Gasoline Program', 103<sup>rd</sup> Cong., 2<sup>nd</sup> Sess., May 27, 1994., 8-16.

the U.S.'s compromised geopolitical position, and the transfer of funds to unstable regions of the world.

In addition to their more enduring activities, many of the entrepreneurs preformed the function of coupling the streams when the window of opportunity was presented. Most notably, it was politicians from the major corn-growing states that played a central role in establishing these links. The substantial benefits that favourable ethanol policy would offer the constituents of these entrepreneurs were obviously a strong motivating factor in their advocacy. However, entrepreneurs from the USDA and the EPA appear to have provided added weight to the arguments and proposals offered by these politicians.

The following chapter will present some of the major findings of the research. This chapter analyses the research presented in chapters four, five, and six to show how factors within each of the streams fit together in order to answer the original research question. The chapter concludes by providing a brief review of the utility of Kingdon's model in explaining the agenda setting process in the lead-up to the passage of the EAct of 2005, and making suggestions for future research.

## CHAPTER 7: ETHANOL AND THE AGENDA

Through Kingdon's multiple streams framework, this thesis has explored the factors and reasoning behind ethanol's placement on the agenda prior to its inclusion in the EAct of 2005. The three previous chapters traced the development of the problem, policy, and politics streams as they evolved from 1970 to 2005. Despite other available opportunities for ethanol to gain policy momentum during this period, the reason it failed to develop into the comprehensive solution it finally became in the EAct of 2005 appears to have been based on the fact that only two of the three streams converged at any one time.

In the 1970s, for instance, the convergence of energy security problems and favourable political conditions led policymakers to decide that ethanol should indeed occupy a small component of the nation's energy policy. In that same decade, a favourable political stream allowed ethanol to gain some consideration as a fuel oxygenate to help correct the smog problem. However, the lack of cohesion within the policy community meant that ethanol did not earn a prominent place on the agenda. Yet by the 1980s, a network of people within the policy community who were focused on ethanol had become well established. Pro-ethanol interest groups and corn state politicians recognised the benefits that would accrue from an expanded ethanol industry, but an unfavourable political environment prevented the issue from receiving significant attention from legislators.

Kingdon's assertion that an item may be placed on the agenda following the convergence of at least two, but ideally three, streams, appears to explain why ethanol occupied such a limited place on the agenda in the 1970s and 1980s, in contrast to its prominent position in 2000. This contrast implies that the chances of an item achieving prominence on the agenda are greatly enhanced by the number of converging streams. Indeed, this case study of the EAct of 2005 shows that all three streams converged more or less directly once a window of opportunity opened in the problem stream. Based upon instances during the 1970s and 1980s, when ethanol was able to make a small amount of progress on the agenda, it seems fair to postulate that the development and union of all three streams were crucial to its prominent placement on the agenda prior to its inclusion in the EAct of 2005. However, while it is evident that each of the streams was in play, and that each was important, this research also suggests that an item's placement on the agenda may be influenced by some streams more than others.

The following section discusses the key factors that contributed to ethanol's arrival on the U.S. agenda. As such, this chapter analyses the dynamics involved in ethanol's ascent which may offer some insight into how other alternative energy technologies may gain placement on the U.S. agenda. The chapter concludes with a discussion of the utility of Kingdon's multiple streams approach in examining the ethanol agenda setting process, followed by several suggestions for future research.

## 7.1 An Idea Whose Time Had Come

This analysis of the decision by the United States government to place ethanol prominently on the agenda suggests that the problem stream played the most central role in capturing the attention of policymakers. Because the issue of energy insecurity was not a highly visible one for the U.S. in the 1980s or the greater part of the 1990s, a crisis element was needed to make the issue more visible. The 1999 energy shortages were a powerful factor in mobilising the U.S. toward gaining a broad consensus on the need to implement comprehensive energy legislation. While supporters of ethanol had long emphasised the fuel's potential to contribute to energy security, the actual need for a comprehensive energy policy helped determine the nature of the response to that policy.

Had the energy shortages emerged gradually, the legislators might have produced an incremental form of ethanol policy. Rather the series of events that followed the 1999 energy shortages (particularly the September 11 terrorist attacks) accentuated the urgency of the problem and created a perception among policymakers and the public alike that a crisis was afoot. In turn, the sense of crisis stirred by events within the problem stream necessitated a crisis response.

According to Ahrari (1987), a crisis response implies that the situation would not have become grave had policymakers anticipated it. Therefore, the response was destined to be disproportionately larger than one developed in a non-crisis environment. The landmark ethanol legislation enacted under the EPAct of 2005 clearly constituted this type of crisis response. The realisation that the energy problems of the 1970s had not been solved and, if anything, had become much worse, provided a powerful impetus toward the formulation of omnibus energy legislation to reduce American reliance on insecure sources of foreign oil by drastically increasing production of domestic energy products.

While the presence of a crisis may determine the magnitude of the policy response, the presence of additional (and complementary) problems may inform the type of policy response that policymakers consider. The more or less simultaneous re-emergence (or re-recognition) of agricultural, economic, and air and water quality problems was a critical factor in the rise of ethanol—especially considering the progress ethanol made when attached to only one (or two) of these streams at a given point in the previous three decades. More important, however, was the shift in understanding about the nature of the problems. Prior to 2000, each area of concern (including energy security) was discussed largely in relative isolation to the other areas. However, after 2000, problems within each of the policy domains were often discussed in conjunction with one another. Instead of being considered isolated problems that required isolated policy responses, the individual issues came to be understood as component parts of the same, much larger problem.

This change of problem definition appears to have had a significant effect on whether the prescriptions proposed to be included in the EPAct of 2005 were considered to be acceptable. If oil insecurity was the primary problem, for instance, then the most obvious solution might have been

to increase domestic production of oil. However, concerns with the environmental consequences of increased oil production would have acted as a strong constraint against such a proposal. The political appeal of ethanol was stronger because its supporters promoted it as a solution that could increase energy security while benefitting the environment and rural economy. Hence, while the perception of crisis induced by the emergence of energy security issues determined the large-scale response, a new understanding of the relationship between the problems shaped the details of the response.

If widespread acceptance of the links between the problems allowed ethanol to capture the attention of policymakers, then an independent process of learning (informed by all manner of scientific and academic studies) might be responsible for shaping legislators' attitudes toward particular policy solutions. After all, how can one predict which problems were to become interconnected? How could one have known if policymakers would even take on this new understanding of the problems? As such, the timing of an item's arrival on the agenda might not allow for prediction because these unique learning processes determine whether or not legislators will accept the correlations between problems.

However, according to Kingdon, focusing attention on one problem rather than another is often not accidental. Focusing attention on the nexus between the problems, promoting research highlighting these relationships, and packaging ethanol as a potential solution suggests that ethanol's ascent to a position of prominence was also no accident. Indeed, since the 1980s pro-ethanol interest groups and policy entrepreneurs attempted to draw the problems together by disseminating information designed to educate both policymakers and the public about the links between the problems and ethanol. In turn, when the problems re-emerged in 2000, ethanol supporters had already laid much of the groundwork by establishing links between the problems and promoting ethanol's potential to correct these problems.

Therefore, while there was undoubtedly a strong element of independent information that confirmed the relationship between the problems as the issues re-emerged, there were also policy entrepreneurs and pro-ethanol interest groups who tried to push them closer together. While an item's placement on the agenda may still rely heavily on a fortuitous set of circumstances (for example, the re-emergence of energy security, environmental, and agricultural economic problems), if legislators believe there are strong links between the issues – and are convinced that they can correct the problems with one policy (such as ethanol) – then they are much more likely to seriously consider that option.

Even as the problem stream may be the factor with the greatest weight for capturing the attention of policymakers, it may be the political stream that is most crucial for the issue to reach and be discussed at the federal level. The importance of the political stream becomes clear when one considers the difficulty faced by ethanol in gaining any policy momentum under President Reagan, despite the presence of agricultural economic problems and a cohesive policy community.

Indeed, according to Kingdon, “no other single actor in the political system has quite the capability of the president to set agendas in given policy areas for all who deal with those policies” (Kingdon 1995, 23). Although the campaign promises of presidential hopefuls are not the same as promises from the president himself, the 2000 and 2004 election campaigns had a similar effect as that described by Kingdon. By making ethanol a central component of their campaigns, not only did the candidates increase the national visibility of the issue; they also sent a clear message to ethanol supporters that their proposals would have a receptive ear in the administration regardless of the election outcome.

The focus on ethanol, of course, had much to do with candidates’ need to secure votes from the constituents of the major corn-growing states. However, the formidable electoral power that farmers and agricultural states exercised was not a new phenomenon. Candidates were able to successfully promote ethanol as a central part of their campaigns during this period (without fear of alienating the wider population of voters) because factors within the problem stream created a favourable public attitude toward government investment in alternative fuels. Indeed, the re-emergence of environmental and energy security problems were two issues that resonated with much of the U.S. public as causes for both concern and action. By presenting ethanol as a solution that could help correct these problems, the candidates appealed to both corn state voters and general voters, and, in the process, created a political environment with a strong impetus towards ethanol.

The effects of environmental and energy issues on the public mood and the campaign orientation of the presidential candidates reflected important links between the political stream and the problem stream. Indeed, contrary to Kingdon’s observation that the political stream may change suddenly, whether or not there are problems facing the country, the political focus on ethanol appeared to have arisen fairly directly from the manifestation of these problems. Therefore, it may be the use of the problem stream and the creation of a sense of crises that stir public opinion and affect the political stream determining the degree of importance an item is given on the agenda.

The favourable national mood and the presidential election campaigns clearly played an important role in promoting ethanol to higher agenda prominence. However, contrary to Kingdon’s (1995, 164) claim that the “mood-elections combination” exerts the most powerful impact on the policy agenda, a careful analysis of the case indicates that the balance of organised political forces ultimately cleared the way for ethanol’s rise. Prior to 2000, the collection of petro-companies that formed formidable opposition to ethanol often blocked the passage of favourable ethanol legislation. However, the shift in the balance of power following the MTBE water contamination scandal limited the blocking capacity of the petro-companies after 2000.

Indeed, the MTBE water contamination scandal not only eliminated ethanol’s chief oxygenate competitor, but also served as a catalyst for splitting the solid bloc of petroleum interests. Given that these companies had advocated alongside ethanol interests for the RFG program, and had been

one of the primary beneficiaries of the legislation, it would have appeared self-serving for them to change their position regarding the ability of the oxygenate requirement to contribute to cleaner air. The only option available to the petroleum interests was to counter the political advancement of ethanol by putting doubts in the minds of legislators about the products' distributional and capacity issues.

However, the petroleum industry's liability for the clean-up costs of contaminated water in addition to the growing number of lawsuits, severely diminished their ability to affect the agenda. Moreover, although it is difficult to discern the exact nature of the bargaining process, this research suggests that some petro-companies supported pro-ethanol interest groups on the inclusion of an RFS in exchange for ethanol interest group support of a liability waiver in the EPAct of 2005. The resulting coalition between ethanol and petro-company interest groups not only cleared the way for ethanol, but also provided additional political weight behind the implementation of favourable ethanol legislation. Therefore, while the public mood-elections combination may exert the greatest influence on the policy agenda, it is perhaps organised political forces that exert the greatest influence on the outcome once the item is on the agenda.

## 7.2 Criteria For Survival

The discussion thus far has addressed how the problem and political streams played a central role in ethanol's rise to the agenda. Yet according to Kingdon, an idea's survival depends in no small part on convincing legislators of the idea's potential to meet policy goals by satisfying certain criteria. As such, this section will address the criteria of value acceptability and technical feasibility, and the influence they exerted on legislators' acceptance of the viability of the ethanol solution.

In terms of value acceptability, it is clear that the values and beliefs Americans place on autonomy was an important force in determining the desirability of the ethanol idea. The fear that continued reliance on unstable sources of foreign oil might impinge on U.S. independence created both a powerful motivating factor for increasing the viability of ethanol as well as an effective image to use in the debate over ethanol. Ethanol supporters and entrepreneurs capitalised on this value by promoting ethanol not only as a way of achieving energy security and ensuring the continuation of American independence, but also as a choice between either funding terrorist states by continuing to buy their oil, or helping struggling American farmers by providing them with an industry for their crops. The broad collection of petro-companies aligned in opposition to preferential treatment of ethanol, on the other hand, lacked the ability to appeal to those same values and images.

In addition to the values placed on national autonomy, the beliefs Americans hold about the agricultural sector also increased the desirability of the ethanol solution. In 2005 the agricultural sector employed less than two percent of the U.S. workforce (Spoel 2009, 54). However, farming

occupies a special place in American society; the historical, moral, and romantic place agriculture maintains in the nation's psyche should not be underestimated (Ibid.). An emphasis on the benefits of ethanol to the health of rural economies can be traced back to the 1970s (and was further re-emphasised throughout the 1980s, 1990s, and early 2000s). The decision of ethanol supporters to highlight this aspect of the debate was not arbitrary, but was related to the high level of esteem that legislators and the public hold for agricultural communities. Indeed, one of the express objectives of the EAct of 2005 was to help farmers with their declining revenue. Therefore, while the revival of the agricultural economy took on added importance in light of the re-emergence of rural economic problems, the intrinsic value associated with the agricultural sector indicates that stimulating the corn market through the increased production of ethanol was perceived as a desirable solution to the nation's energy woes.

However, this research also suggests that value acceptability alone was not enough to make ethanol the most desirable solution. If it was, questions are raised as to why ethanol was not implemented as a comprehensive solution long before its inclusion in the EAct of 2005, especially considering the favourable political stream and crisis environment in the 1970s. Following this logic, value acceptability may be important to the extent that it allowed advocates of proposals to capitalise on these values by promoting links between an idea and a dominant set of beliefs. However, understanding why ethanol emerged as the most viable solution when it did requires additional explanation.

One of the most debated issues concerning the technical feasibility of ethanol revolved around its impact on air quality and its effects on human health. Controversy infused the trade-offs involved in developing a comprehensive assessment of ethanol's effect on the environment. Information generated within the scientific community concluded that ethanol-blended gasoline had the potential to reduce CO emissions, but in so doing it would increase other harmful emissions such as NO<sub>x</sub> and VOCs. Despite some agreement among members of the scientific community, such as the USDA and the EPA, regarding ethanol's potential to reduce CO emissions, there was—and still is—no clear agreement on which of the pollutants might be least harmful to air quality and human health.

The lack of an overwhelming scientific consensus regarding ethanol's ability to contribute to cleaner air was also reflected in the community's assessments of ethanol's potential to contribute to the nation's energy security. While the studies reviewed for this analysis progressively became more optimistic about the prospects for a positive net-energy return over time, the overall impression of legislators depended largely upon which of the many studies they consulted. If one were to subscribe to information generated by the USDA or the USDOE, for example, then the net-energy return from ethanol production would appear to be significant. Conversely, if one were to believe studies conducted by scientists such as David Pimentel, then it would be clear that ethanol had virtually no potential to contribute to the nation's energy security.

Therefore, despite a tenuous balance of research that favoured ethanol's potential to contribute energy security and cleaner air, the amount of consideration policymakers gave to ethanol as a potential solution to these problems extended far beyond what the evidence appeared to warrant. The lack of a comprehensive scientific consensus on these key issues suggests that other factors were at play. One plausible explanation was that the politically strategic ways in which information was deployed, more so than simply the quantity or quality of information, had the greatest effect on swaying policymakers.

Indeed, many of the politicians and pro-ethanol interest groups that helped to develop the solution (and would be the primary beneficiaries of the legislation) were the same ones who engaged in campaigns to educate Congress and the public on the desirability and technical feasibility of ethanol. The wealth of information available to them meant they were able to choose which information to promote and which to ignore. Their dissemination of the analyses was well timed, and tailored to the specific concerns of policy makers while appealing to a diffuse national audience. Conversely, other than politicians from oil-producing states, there was not much incentive for members of Congress (where the impacts of the program were small and dispersed) to expend resources to uncover more accurate information about the underlying costs and benefits of ethanol (Johnson et al. 2000, 22).

Aside from the more enduring efforts to soften-up the system to the idea of ethanol, perhaps the greatest achievement of these key policy actors was gaining the support of two important federal agencies: the USDA and the EPA. These agencies had resources at their disposal that, combined with their high visibility, provided a great deal of weight behind the positions of pro-ethanol interest groups and entrepreneurs. Although both agencies clearly had much at stake, their formal status as independent agencies lent a degree of credibility to the case being made for ethanol, especially given the array of competing information on the subject.

The efforts of these agencies to build an empirically grounded case demonstrating the benefits of a pro-ethanol policy, while reducing uncertainty concerning undesirable consequences, were indispensable in making a convincing case for ethanol. At numerous congressional hearings, the USDA and EPA presented evidence to show that ethanol was a feasible solution to all three major areas of concern—air quality, rural economic decline, and energy security. While the EPA focused on presenting ethanol as a solution to environmental problems, it also stressed ethanol's contribution to energy and agricultural goals. Similarly, while the USDA's primary consideration was ethanol's potential to stimulate rural economies, the agency also concentrated efforts on demonstrating ethanol's contribution to energy security and cleaner air.

The USDOE also played an important role in advancing the ethanol idea. While the agency exhibited more caution in its support of corn-based ethanol as a long-term solution to energy insecurity, the USDOE focused its efforts on promoting ethanol produced from cellulosic biomass. As such, the USDOE created a degree of ambiguity around objections to ethanol that were based

on concerns related to efficiency, cost, or the possibility that ethanol might divert production away from food crops. By promoting corn ethanol as a necessary step toward achieving more efficient and less costly cellulosic ethanol (produced from inedible biomass), the agency helped nullify these arguments as a matter of long-term concern.

Regardless of whether or not the USDA or EPA would have become such strong supporters of ethanol in lieu of the pressures exerted by ethanol's supporters, the involvement of government agencies (including the USDOE) had an important effect on legislators' acceptance of the viability of the solution. Their individual efforts to disseminate information that portrayed ethanol as a feasible course of action addressing all three areas of concern (energy, the environment, and agriculture) provided a powerful impetus towards ethanol's serious consideration. However, it was perhaps the close alliances formed between the agencies and their agreement on several key issues of concern that created the greatest testament to ethanol's technical feasibility. The combined political power and visibility of the agencies not only helped determine the idea's survival, but also provided a formidable obstacle to those who generated divergent information.

Thus it may be possible to overcome a lack of consensus within the policy community over an item's technical feasibility if the idea is congruent with a dominant set of beliefs, and if powerful supporters are able to fill any ideological gaps with favourable information. Accordingly, it may be that legislators' perceptions of an idea's technical feasibility depend more on the political weight of those making the arguments than on achieving overarching consensus. Yet whether or not the policy community possess the necessary weight to sway policymakers, this research also suggests the policy community would have little effect on the discussion without a favourable political stream and a body of problems with to which to attach the solution. Thus, consistent with Kingdon's observation, the combination of factors within all three streams were ultimately responsible for ethanol's prominent placement on the agenda prior to its inclusion in the EPAct of 2005.

### 7.3 The Utility Of Kingdon's Model

Kingdon's model of the agenda setting process applied very well to the case of ethanol, which is interesting considering how different this policy area is from the ones that Kingdon studied. The use of the framework and its independent variables (problems, policies, and politics) has not only helped to identify the factors that explained ethanol's arrival on the agenda but also shed light on why ethanol's ascension to the agenda did not occur in the previous decades. Contrary to criticism that the independence of the streams is a weakness in the model, the separation of the streams into independent components of the agenda setting process provided order to the complex and heterogeneous reality of the process examined in this study. Tracing the historical antecedents of ethanol's emergence on the agenda allowed for discernible patterns of the forces that guided activity within the streams to emerge from what would otherwise be a particularly messy process.

It may seem like a truism to say that an item gets on the agenda when a problem is recognised, people believe something can be done about it, and the political conditions are favourable to give it serious consideration (Mucciaroni 1992, 463). However, one of the major strengths of Kingdon's model is that it is flexible enough to explain the particularities of a specific case. Because the model does not predetermine what kinds of problems are likely to be coupled with what kinds of policies, or what kinds of political conditions make it more likely for them to get on the agenda, one can explore the unique set of circumstances that contribute to an item's arrival on the agenda. As such, the model provides a useful framework for analysis in which the streams serve as conceptual slots that one fills with facts concerning the substantive attributes of the particular case (Ibid.). Kingdon's model allows one to capture the complexity and fluidity of the agenda setting process, free from the constraints of an overly mechanistic model of agenda setting in search that exclusively searches for hard regularities.

The model understands agenda changes "as contingent rather than automatic outcomes, and specifies probabilistic rather than necessary and sufficient conditions" (Ibid. 461). As such, one finds in the process of stream convergence and in the timing of an item's arrival on the agenda a certain arbitrary quality. Therefore, while Kingdon's framework is useful for explaining the particulars of a given case, it is unclear which findings of this examination of the ethanol agenda setting process would be applicable to other cases. What is needed, then, is further research to determine any broader implications of this study.

## 7.4 Suggestions For Future Research

The case has identified many of the key factors and actors in what was a very lengthy and complex process, which provided a clearer picture of why and when ethanol emerged on the agenda. As with any study, however, possible improvements and areas for future research become more apparent as the study progresses. Suggested areas for future investigation include the use of interviews and surveys to examine more closely the roles of the policy community and policy entrepreneurs, the use of the multiple streams model to examine the rise of ethanol in different countries, and the use of the model to investigate the factors responsible for the placement of other alternative energy technologies on the agenda.

Using Kingdon's model to examine the passage of the EAct of 2005 has provided some interesting revelations concerning ethanol's arrival on the agenda. However, the examination of a single case makes it difficult to discern what implications the findings may have for other cases. Because of Brazil's status as the second largest producer of ethanol in the world (behind the United States), the country could be one particularly interesting comparative case to apply the multiple streams framework. By extension, examining whether or not Kingdon's model of the agenda setting process might explain the rise of ethanol in developing countries could prove useful as well.

Additionally, Kingdon's multiple streams framework could be used to examine the rise of other forms of alternative energy in the United States. Applying the model to other forms of emergent energy technology and making comparisons to the way ethanol rose to agenda prominence could reveal patterns in the way alternative energy technologies manage to attract serious consideration in the United States.

The absence of interviews in conducting this investigation is perhaps the greatest limitation of this thesis. While the use of primary sources such as congressional hearings and discussions enabled identification of some of the most visible actors in the agenda setting process, interviews could have further identified those actors involved who belonged to the "invisible cluster" (Kingdon 1995, 68-70).

According to Kingdon, these less visible participants may not exert much influence on the agenda, but they may have an important effect on the alternatives that are considered. Efforts were made in this investigation to identify the most important participants in the policy stream and to assess the effect they had on legislators' consideration of the ethanol alternative. Despite these efforts, however, the large number of members of the scientific community, the vast body of information they produced, and the complexity of the issues their research addressed resulted in some ambiguity concerning the exact influence specific pieces of research might have had on the policy stream.

Interviews are an efficient way to clarify the roles of the invisible cluster and determine the influence they (or their research) exerted on the policy stream. Interviews with the most visible members of the scientific community who had a significant involvement in ethanol research and were familiar with other members of the community and their work would have been an invaluable resource. Prominent researchers such as David Pimentel from Cornell University, who was a strong critic of ethanol, and Bruce Dale from Michigan State University, who was a strong proponent of ethanol, could have suggested people to contact who had an important effect on the policy community, but who were less prominent in the community.

In addition, interviews would have helped clarify the activities of ethanol's policy entrepreneurs. This research has made progress in identifying some of the most important individuals involved in the agenda building process. However, without input from the individuals involved (or those closely associated with them), it is difficult to discern exactly what types of activities they were involved in and what specific affect they had on coupling the streams. A series of interviews with several of the primary entrepreneurs (or their associates) would aid in understanding the details of the case and help to develop a clearer picture of policy entrepreneurs' roles in connecting the streams. For example, as the lead architect of the original RFS, former Majority Leader Tom Daschle would hold a wealth of information regarding the policy entrepreneur's role. Considering the presumed difficulty in reaching Mr. Daschle, a former staffer from his office during the 106th, 107th or 108th congresses could provide some useful information.

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## APPENDIX: HISTORY OF FEDERAL ETHANOL LEGISLATION AND SUBSIDIES

1978	Energy Tax Act of 1978	\$0.40 per gallon of ethanol tax exemption on the \$0.04 gasoline excise tax
1980	Crude Oil Windfall Profit Tax Act and the Energy Security Act	Promoted energy conservation and domestic fuel development
1982	Surface Transportation Assistance Act	Increased tax exemption to \$0.50 per gallon of ethanol and increased the gasoline excise tax to \$0.09 per gallon
1984	Tax Reform Act	Increased tax exemption to \$0.06 per gallon
1988	Alternative Motor Fuels Act	Created research and development programs and provided fuel economy credits to automakers
1990	Omnibus Budget Reconciliation Act	Ethanol tax incentive extended to 2000 but decreased to \$0.54 per gallon of ethanol
1990	Clean Air Act Amendments	Acknowledged contribution of motor fuels to air pollution
1992	Energy Policy Act	Tax deductions allowed on vehicles that could run on E85
1998	Transportation Efficiency Act of the 21st Century	Ethanol subsidies extended through 2007 but reduced to \$0.51 per gallon of ethanol by 2005
2004	Jobs Creation Act	Changed the mechanism of the ethanol subsidy to a blender tax credit instead of the previous excise tax exemption. Also extended the ethanol tax exemption to 2010.
2005	Energy Policy Act	Established the Renewable Fuel Standard starting at 4 billion gallons in 2006 and rising to 7.5 billion in 2012.

Source: North Dakota Chamber of Commerce (2006)