

# Contents

ix

Acknowledgements	
Introduction	1
I The Political Impetus	7
The Arab oil embargoes and energy upheavals of the 1970s had a dramatic impact on the American psyche, generating a fevered political response leading inter alia to the U.S. Synthetic Fuels Corporation.	
II Synthetic Fuels Potential	33
The SFC mandate was to exploit America’s vast oil shale and coal resources to provide alternatives to imported oil. There were many technologies that, based on pilot-scale testing, had the potential to convert those resources into such alternatives—if the technology and the economics could be proven at commercial scale.	
III Passing the Energy Security Act	51
After extensive hearings, consideration of many alternative approaches, and significant opposition, the Energy Security Act was passed by Congress in 1980.	
IV Provisions of the Energy Security Act	63
The Energy Security Act set ambitious goals to establish a commercial synthetic fuels industry that could produce 2 million barrels a day within a decade. Its legislative provisions matched those ambitions with innovative financial instruments, Marshall Plan-scale funding of \$88 billion, and the establishment of a unique quasi-federal entity, the SFC.	
V Getting Underway	77
The Corporation got off to a fast start with a prestigious Board, appointed by the president, which engaged an initial staff drawn largely from Wall Street and the private sector and which expeditiously issued a solicitation for proposals to build the nation’s first commercial synthetic fuel plants.	
VI Charting the Mission	89
A second Board, appointed by the newly elected Reagan administration, moved to deal with the sixty-eight proposals received under the Initial Solicitation and designed an ongoing solicitation approach for attracting projects, which imposed rigorous standards for project engineering and cost estimates.	
VII Shakedown of Operations and the First Award	107
Over a year-and-a-half period, the Corporation completed work on the Initial Solicitation, issued the next two general solicitations, evaluated the proposals received, signed the first letters of intent to issue awards, and completed the first financial assistance contract.	
VIII Casting a Wider Net	143
With experience from the first two solicitations in hand, the Board issued a number of targeted solicitations designed to	

attract a fuller array of technologies consistent with meeting the Act's diversity goals.	
IX Full Steam Ahead	171
The Corporation hit its stride: negotiating ten letters of intent and approving another award so that by 1984, the Corporation had three assisted projects underway, as well as a broad slate of projects in negotiation, which represented all the principal synthetic fuel resource bases and technologies.	
X Time to Regroup	201
Changing times—in energy markets, in political support, and in resignations from the Board—led to new legislation, a new Board of Directors, and a new strategic direction set out in a Comprehensive Strategy Report.	
XI The Last Accomplishments	227
In accordance with far more modest congressional direction and the Comprehensive Strategy, the Corporation revisited the terms of eight letters of intent, evaluated new proposals received during the interregnum, and issued new solicitations for projects necessary to complete the Program envisioned by the revised congressional mandate. These efforts produced two more assistance awards, though it came within a hair's breadth of an additional two.	
XII Eroding Political Support	247
Exploiting reduced public interest in energy matters, ideological opponents of the SFC drew on congressional allies and a sympathetic media to undermine political support for the Corporation.	
XIII The Denouement	303
Highly contentious congressional debates in conjunction with rare parliamentary maneuvers led to legislation that prematurely terminated the Corporation and transferred administration of contracts for four approved projects to the Department of the Treasury.	
XIV Epilogue	333
Five commercial-scale synthetic fuels projects were ultimately built and operated, thereby generating substantial experience regarding technology development, environmental impact, and the use of innovative financial incentives by the government—at a surprisingly modest cost.	
Appendices	351
A—Primary and Secondary Coal Conversion Technologies	
B—Solicitation Summary	
C—Timeline of Key SFC Events	
D—Findings of the Hagler, Bailly Report	
E—The Santa Rosa Project Hearing	
F—A Representative Letter of Inquiry from Congressman Dingell	
Works Cited	367
Notes	375
Index	387

## Introduction

*The Saga of the United States Synthetic Fuels Corporation: A Cautionary Tale* presents a history of the U.S. Synthetic Fuels Corporation (SFC) set in the context of the country's last energy crisis, which hit in the 1970s. Although Congress launched the Corporation as a major national initiative, authorizing it \$88 billion (\$230 billion in 2010 dollars)—twice the size of the Marshall Plan that rebuild Europe after the Second World War—its history and the results of its endeavors are barely known today. To be sure, the final outcome was far more modest than the “moral equivalent of war” claimed by President Carter. But much was learned that can inform the country as it grapples anew with energy policy. It is also an untold story of political conflict in the nation's capital, a cautionary tale about grand energy crusades.

The SFC was created when the country had grown anxious about an apparent loss of energy security, as demonstrated by skyrocketing prices, a disconcertingly sudden dependence on foreign oil, and a sense of vulnerability induced by foreign countries' willingness to use oil embargoes as weapons. This book shows how Congress and the president reacted to these circumstances. Congress initially passed some modest legislation strengthening conservation efforts and accelerating research for alternative fuels. But after the Iranian Revolution of 1979 and another bout of accelerating oil prices, President Carter determined that a much more dramatic national effort was required. The SFC would be that effort's centerpiece.

Synthetic fuels, alternatives to petroleum and natural gas derived from solid resources, were the focus of the new effort. The United States' vast non-petroleum energy resources, largely coal and oil shale, contain the energy equivalent of all the oil in the Middle East many times over. Past efforts in other countries appeared to endorse endeavors to employ new technology to address strategic insecurity, notably Germany's synthetic fuels industry that was created when the Second World War shut off that country's petroleum supplies and South Africa's undertaking a synthetic fuels industry that met more than half that country's petroleum needs when it appeared that Arab embargoes might shut it out of petroleum markets.

Although many technological approaches for producing liquids and gases from these solid resources had been identified and attempted at a pilot scale in the United States, they had not been proven at commercial scale. Doing so would entail building plants ten or more times larger than had ever been attempted and which would have cost billions of dollars apiece. Moreover, experience in other industries showed how difficult unanticipated operating problems could be. Companies simply would not take on all of those risks themselves. Thus, in 1980 Congress created the SFC, a quasi-federal institution, to assist the private sector in creating an entirely new industry, one that was to produce 2 million barrels a day of synthetic fuels within a decade, thereby displacing a significant fraction of imported oil.

The book recounts the history of the six-year life of the SFC: its structure and operating philosophy, how it solicited and evaluated proposals from the private sector, how it negotiated assistance contracts, as well as specific aspects of the synthetic fuels projects it supported. In so

doing, the book shows how changing energy circumstances and the realities of the market place inexorably moved the Corporation away from the grand aspirations of the Energy Security Act to a more sensible development of a modest array of key technologies at commercial scale, which the country would have at the ready whenever they should be needed.

As it happened, in 1985—a mere five years after it launched its ambitious effort to achieve energy security—Congress fecklessly terminated the Corporation, thereby aborting both the grand effort as well as the course correction that it and the SFC's management belatedly determined to be economically and strategically sensible. Although the SFC had completed financial negotiations with about thirteen projects that represented a promising diversity of energy resources and technologies, the congressional action terminated the Corporation after assistance contracts had been finalized with but four projects.

The book summarizes the history of the four projects the SFC funded, as well as that of another funded by the Department of Energy that was originally intended for transfer to the SFC. It relates the extensive experience gleaned regarding how well these technologies work at full scale, what they cost to build, how quickly experience reduced operating costs, and just how difficult debugging new technologies can prove to be. It also summarizes their environmental performance, which had been intensively monitored.

Finally, the book presents an illuminating case study of how a determined ideological constituency can work its way in the national political arena in the face of what appears to be a general consensus, and in this instance contrary to the staunch support for the Corporation by the leaders of both parties in both the House of Representatives and the Senate. Ultimately, the outcome can be traced to a fall in oil imports (however temporary), a decline in gasoline prices (also temporary), and waning public interest. But in the instance of the SFC, unremitting hostility by the environmental community, hostile congressional hearings, repeated GAO investigations (which produced no findings to the detriment of the SFC), and demagogic speeches on the floor of congress over the years took their toll as well, leading to the SFC's untimely end. Now merely a few decades later, virtually nothing is known of this—no books have been written and other media are seemingly oblivious to the program's accomplishments.

Other than a filling a bewildering gap in the historic narrative, what does this book offer? It offers necessary perspective at a critical juncture. The SFC experience can provide pragmatic lessons for structuring future governmental programs in partnership with the private sector (if any) and provide cautionary lessons for Congress to keep in mind before it contemplates any new energy crusades. Five pioneer commercial-scale production facilities (one under the aegis of the Department of Energy before the SFC became operational) were built and operated. These can provide operating experience essential for exploiting some of America's vast energy resources that are in solid rather than liquid or gaseous forms, whenever and however that might be justifiable on economic or national security grounds. In addition, years of operating experience by these projects demonstrated that these new technologies were environmentally benign with regard to air, liquid, or solid emissions and produced either no offsite discharge or operated comfortably within regulatory limits. Because prior to the program concerns existed about the potential environmental impact of these new technologies, the Energy Security Act required project sponsors to develop detailed environmental monitoring plans. Accordingly, these projects undertook years of monitoring under the guidance of the Corporation, the

Department of Energy, and the Environmental Protection Agency. This experience is also now available to any that might need it in future energy developments.

Moreover, the Corporation's experience with the innovative financial methods authorized by the Energy Security Act demonstrated the utility of price and loan guarantees to encourage the private sector to build sizeable facilities with surprisingly modest government support. These had the added virtue of keeping the technological and commercial design of these facilities under the management of those who understood commercial needs the best. Despite uninformed claims in relatively recent media articles that the SFC wasted billions of dollars, the costs to the government of all four commercial-scale facilities and all the administrative costs of the Corporation came to less than one billion dollars.

Negative lessons to be drawn from experience during the 1970s generally and with regard to the ambitions of the Energy Security Act in particular show how the federal government, president and Congress alike, tends to overreact and reach for grandiose solutions. The book shows how some crises were self-inflicted by governmental distrust of free markets. For example, the extensive price controls, regulations, and excess profit taxes enacted in the U.S. created shortages and a sense of panic experienced by no other developed country, even those with no domestic production of petroleum whatsoever. Moreover, proposed solutions were too often driven by dramatic rather than pragmatic and prudent considerations. Notably, during the congressional debate over the Energy Security Act, there were a number of proposals to carry out a limited program to first prove technologies before undertaking a massive production effort. These lost out to desires to create a major new industry in short order commensurate to the perceived national security challenge. Eventually, market reality forced the Corporation and a later Congress to accept the wisdom of a more limited approach, before Congress lost its appetite for synthetic fuels entirely. Ultimately, the government's credibility suffered. Congress appeared feckless, private corporations became more distrustful of doing business with the government, and the concept of a quasi-federal corporation was unfairly discredited.

Today, the United States has once again reached a political juncture in which the government is overdramatizing a perceived problem—in this case, the threat of global warming. In response, Washington is attempting to impose a vast new regulatory structure on energy sectors of the economy and to spend substantial monies on still uneconomic 'green energy.' The experience of President Carter's moral equivalent of war suggests that economic reality will ultimately corral the more grandiose initiatives being considered in present day debate, but perhaps not before they punish the U.S. economy with costs far beyond those of the synthetic fuels program.

The following fourteen chapters are intended to help complete the sorely deficient historical record by portraying how a past energy crusade unfolded, thereby shedding light on current energy policy debates.