

Acknowledgments

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About the Koret-Milken Institute Fellows Program

The Koret-Milken Institute Fellows Program accelerates Israel's economic growth through innovative, market-based solutions for long-term economic, social, and environmental issues. The program focuses on connecting government, philanthropic, and business resources that are vital to national growth and development.

Directed by the Milken Institute Israel Center, the Koret-Milken Institute Fellows Program awards annual fellowships to outstanding graduates of Israeli and international institutes of higher education. Fellows serve yearlong internships at the center of the nation's decision-making—the Knesset, government ministries, and other Israeli agencies—and aid policymakers by researching and developing solutions for various economic and social challenges.

In addition, fellows craft their own policy studies aimed at identifying barriers to economic and employment growth in Israel. The fellows' studies, carried out under the guidance of an experienced academic and professional staff, support legislators and regulators who shape the economic reality in Israel. The program offers the ultimate educational exercise, combining real-life work experience with applied research five days a week.

Throughout the year, fellows receive intensive training in economic policy, government processes, and research methods. They acquire tools for writing memorandums, presentations, and policy papers, and they develop management, marketing, and communication skills. The fellows participate in a weekly workshop, where they meet senior economic and government professionals, business leaders, and top academics from Israel and abroad. They also participate in an accredited MBA course that awards three graduate-level academic credits that are transferable to other universities in Israel. The course, which focuses on financial and economic innovations, is taught at the Hebrew University of Jerusalem's School of Business Administration by Professor Glenn Yago, Director of the Milken Institute Israel Center and Director of Capital Studies at the Milken Institute in California.

Fellows Program alumni can be found in senior positions in the public and private sectors. Some serve as advisers to government ministries while others work at private-sector companies or go on to advanced studies at leading universities in Israel, the United States, and Great Britain. Within the program's framework, more than 80 research papers have been published, catalyzing reforms, reducing barriers, bringing about economic growth, and improving the quality of life for Israeli citizens.

The Koret-Milken Institute Fellows Program is nonpolitical and nonpartisan. It is funded by the Koret Foundation, the Milken Institute, and other leading philanthropic organizations and individuals in the United States and Israel.

More about the program: www.kmifellows.org

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Executive Summary

The demand for energy resources and fossil fuels grows constantly. Recent forecasts predict that global demand will increase from 85 million barrels a day (mb/d) in 2008 to 88 mb/d by 2015 and 105 mb/d by 2030. This rapid growth in the demand for crude oil, especially in emerging economies, is driving a global quest for alternative resources and other innovative solutions.

This is due to three main factors:

- **Security concerns:** Most crude oil reserves are in the hands of unfriendly and unstable regimes.
- **Environmental concerns:** The emission of CO₂ and other pollutants causes global warming and various diseases.
- **Economic concerns:** The use of fossil fuels is expensive, with costs both direct (the price of oil and its volatility) and indirect (the environmental expense).

In February 2010, Israel announced that it will join the global effort to reduce oil dependency in transportation through four sectors: biofuels, synthetic fuels, internal combustion systems, and electric/hybrid systems.

Israel has experience with such ambitious efforts. It transformed the high-tech industry, especially information systems, into the Israeli economy's leading growth engine, from a mere 5 percent of total exports in the 1980s to approximately 50 percent in 2009¹. However, replicating this success in the alternative energy market is difficult because the two industries have different characteristics. The energy industry requires more extensive resources (both in time and money). It is conservative because it must supply a highly reliable product at a certain commodity price. The energy market is also heavily regulated and dominated by a few key players. All of the above leads to a high-risk market that causes investors to be more cautious. Although they see the opportunity, many balk at the risk and the long-term investment.

Global renewable/alternative energy investment appears to be escalating, although the last couple of years have seen a significant drop (due to the economic downturn). Still, 2010 seems on track to be a record year for energy investment². Many nations implemented stimulus programs as a means of countering the economic downturn. Out of a total of \$177 billion in energy-related stimulus, \$50 billion is allocated to various forms of energy R&D globally. In the United States, venture capitalists invested just \$129 million in the energy sector in 2009—a tiny fraction of the \$2 billion they poured into the biotech and the IT sectors combined that year. These investments can help build the supply side of renewable resources. On the demand side, nations can build a market through regulations such as fuel blending mandates.

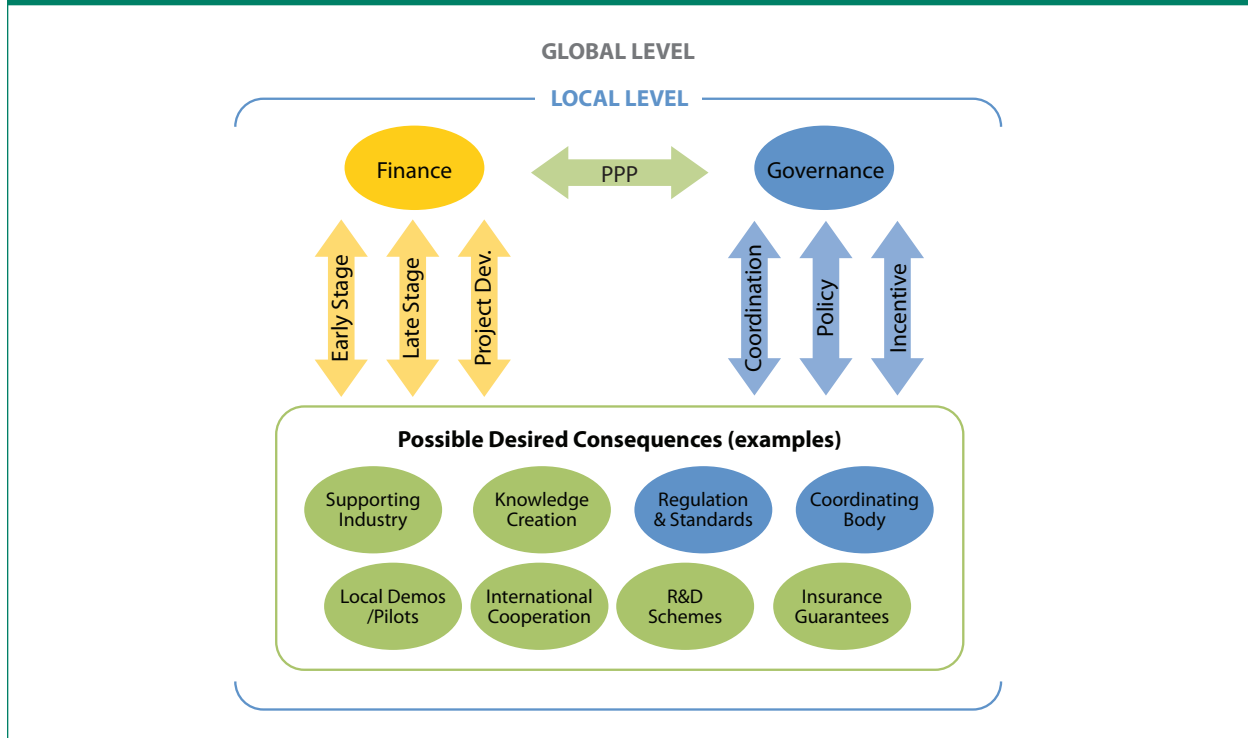
Since the energy market is different from the information technology (IT) market, the strategies Israel used to build IT must be modified for energy. As a first step toward proposing new strategies, we mapped the market barriers that prevent the fuel substitutes market from developing. A preliminary review of literature identified several barriers, and an online survey asked relevant companies in Israel to review and rate those barriers and suggest others. Ninety-five companies—most of them still in the initial R&D stages—were identified in the survey’s preliminary stage, but just 53 were active companies and received the questionnaire. Seventeen answers were received, for a response rate of 33 percent.

Figure 1 illustrates the barriers and their respective scores on a scale of 1 to 4. All barriers could be divided into two categories: policy/governance barriers and financial barriers.



Based on these findings, we have created a conceptual model that describes governance and finance as “superbarriers.” Combined, these superbarriers create other barriers and unintended consequences. Eliminating only one superbarrier will not be efficient. Only a collaborative effort to solve both can lead to a sustainable fuel substitutes industry.

Figure 2. Superbarriers conceptual model



Using this line of reasoning, we have outlined potential solutions for the governance and finance superbarriers and five strategies to achieve them.

Strategy 1: Form a central government authority

It is essential to form a central government authority (or use an existing one) to coordinate efforts, eliminate duplication and red tape, and oversee a long-term, sustainable energy policy. The authority needs allocated budgets and the appropriate human resources to achieve its goals.

Strategy 2: Use existing policy and finance tools

Many proposed solutions will be introduced using this strategy, based on the assumption that it is easier and faster to modify and implement already successful schemes. Using “sister” programs will also help overcome organizational resistance. For example, public-private early-stage funds could be modified for more substantial investments over a longer period of time; such a fund would help companies overcome the first “valley of death”—the name given to gaps in capital as companies move through different stages of development. Another proposal deals with research, development, and demonstration (RD&D) funds to help companies hurdle the second valley of death, which is the demonstration stage in Israel. This will somewhat reduce the risk involved in infrastructure investment.

Strategy 3: Promote international cooperation

Israel's economy is too small to distribute its technology locally, so it should cooperate with foreign governments, academia, and industries. The Ministry of Trade and Industry's NewTech program, initiated three years ago to promote Israel's clean-tech companies, is already identifying business opportunities and acting as a matchmaker for Israeli companies in the international arena. Israel should strive to sign agreements with developing economies such as India and China to create demand for its technologies.

Strategy 4: Create a local test market

Creating a demand side, i.e. a local market, is of vital importance because new, unproven technologies are less attractive to investors. The Israeli government could promote energy innovation by agreeing to subsidize to some extent the use of disruptive technologies. A few examples are:

- Using government as a first adopter
- Encouraging corporations to act as first adopters through incentives
- Creating an insurance pool for such tests
- Developing a guarantee scheme to allow bankable credit for projects

Strategy 5: Use the military and defense-related industries as change agents

Israel's high-tech industry was conceived in the Israeli army for defense purposes. This has allowed the industry a relatively long period of inception, creating spillovers and a cadre of experts. The same could be done with energy. If fuel substitutes were defined as a national priority, many interdisciplinary experts would start working on long-term solutions.

In summary, this research extensively maps the main barriers and superbarriers that prevent the development of innovation-based fuel substitutes industry in Israel. The same barriers exist in other economies, and various solutions have been proposed and applied to solve them. Some of these solutions could also fit Israel with certain modifications.

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