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Executive Summary
**Beta Site Financing
for Fuel Choice Initiatives**

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About the Milken Innovation Center Fellows Program

The Milken Innovation Center Fellows Program accelerates Israel's economic growth through innovative, market-based solutions for long-term economic, social, and environmental challenges. Our goal is to accelerate Israel's transition from a Start-up Nation to a Global Nation with solutions that others can replicate.

The Program awards annual fellowships to outstanding Israeli graduate students. We train and deploy some of Israel's best and brightest young professionals to create pragmatic financing and economic policy solutions. Our applied research and Financial Innovations Labs® are a launching pad for transformative change, using innovative financing mechanisms, programs and policies to bridge social, regional, economic and productivity gaps within Israel and between Israel and the world.

In addition, Fellows craft their own projects during their internship aimed at barriers to job creation and capital formation in Israel. The Fellows' research, carried out under the guidance of an experienced academic and professional staff, support business and policy makers to shape economic reality in Israel. The program offers the ultimate training opportunity, combining real-life work experience with applied research.

Throughout the year, Fellows receive intensive training in economic and financial analysis, public policy and research methods. They acquire tools for communication and presentation, policy analysis, leadership and project management. The fellows participate in a weekly research training workshop where they work with senior economic and government professionals, business leaders, and top academic and financial practitioners from Israel and abroad. They also participate in an accredited MBA course, taught at the Hebrew University School of Business Administration by Prof. Glenn Yago.

Fellows Program alumni can be found in senior positions in the public and private sectors. Some serve in key positions in government ministries while others work at private-sector companies or go on to advanced graduates studies at leading universities in Israel, the United States and Great Britain.

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The usage of alternative fuels for transportation is now a few years old. In the US and Europe programs were designed, bills were conducted and standards were implemented to encourage low emitting cars and improvements in miles to gallon efficiency. These are all part of a universal effort to reduce greenhouse gases (GHGs), enhance cooperation between countries, and encourage energy independence. In Israel, following Government Resolution 1354, passed in 2010, and Resolution 2790, passed in 2011, the Fuel Choices Initiative (FCI) was formed. One of FCI goals is to, "reduce the share of crude oil in Israel's transportation sector by 30% by 2020 and by 60% by 2025 while supporting green growth." There are 318 active companies in Fuel Alternatives (FA) and Smart Transportation. From these groups, only a few companies operate in the Biofuels and Synthetic fuels sectors.

Defining the problem

Renewable energy companies and especially FA companies, of which biofuels and synthetic fuels form a subcategory, develop and produce innovative technology. High risk and over-estimation of risks by investors, and general conservatism make it challenging to raise capital to for innovation. In order to improve sources of capital, the government should endorse the needs of the different investors, creating financial instruments to fit the investor's needs (i.e. tolerance of risk, ROI, ROR, acquaintance with the field, etc.) More, there are also some internal challenges in the fuel alternatives sector worth mentioning¹:

1. Investors are prone to over-emphasizing risks involved in sectors which are not familiar to them, thereby discouraging innovation
2. There are very few financial instruments which support the mitigation of risks involved, which raises the cost covering liability
3. Building a Beta Site in the FA sector could be as expensive as \$50m. This large investment, combined with high-perceived risk by investors and few supporting instruments comprise of a challenge to raise capital.

Main Financial instruments around the world

There are a variety of financial instruments which exist globally to support the FA sector, which can be broken down into five categories:

¹ As described by Eliot Jamison, calCEF 2010

- **Public initiatives:** These include subsidies, loan programs, and an obligation for diluting biofuels in the national capacity of fuels.
- **Private initiatives:** These include strategic alliances between big corporations and young firms developing new technology (e.g. cooperation between ExxonMobil with Synthetic Genomics in the Algae sector).
- **Public-Private Cooperation:** This includes building joint funds and JV (e.g. SDTC That operates in Canada and provides capital with debt instruments).
- **Tax instruments:** This refers to the usage of tax benefits for investors, ITC, ITP, and Accelerated Depreciation. Usage of MACRS (define this) in the US has decreased cost of capital by up to 30% in some cases.

Insurance Instruments: This refers to the usage of insurance instruments which have a large amount historical data, contribute to building statistical models in proved technologies. These models can decrease cost of capital by up to 20% in some ways possible.

Financial instruments in Israel

There are only a few financial instruments available in Israel. These instruments can be divided into two categories: Support Programs and International Funds. The main support program is the Co-Investment Fund, a joint Program by the FCI with the Chief Scientist in the Ministry of Economy. The fund was budgeted for 400 MILS until 2020. Nevertheless, this initiative is consistently plagued by low usage due to the fund's demand for companies to finding a matching investment in addition to the fund's money. Two other programs are the Pilot and Demonstration (PD) Program at the Ministry of Energy and Water Resources and the R&D fund at the Chief Scientists office, Ministry of Economy. While the PD supports companies at the critical level of Pilot facilities, it can only fund projects up to 1.5 million shekels (NIS). This amount of money does not provide enough funds for the companies in FA Sector .The R&D fund, supports early stage companies and is not intended the commercialization stage. In addition to the three funds mentioned, some international funds operate in Israel, such as: BIRD, Israel-Korea, Israel-Canada, And Horizon 2020. These funds promote cooperation between countries mainly in fields of R&D, but usually do not support commercialization phase of companies. All in all, the tools mentioned above do not provide enough support needed for companies in the FA sector.

Recommendations

Below are a number of recommendations intended support the needs of developing beta sites and alleviate the financing difficulties present in the FA sector:

1. Building a "quick route" to receiving permits for Beta sites in cooperation with the other ministries party to the FCI. After meeting with companies in FA sector and examining other research done, receiving a permit is one of the most challenging tasks in FA sector. Creating this shortcut would consolidate all of the various steps of the process under one roof, has a negligible cost, and is critical to the development of FA companies.
2. Changing the model of the Co-Investment Fund: This would enable the government to support more companies and better promote the FA sector. In practice, the fund could allocate 100 million NIS per year (400 million NIS until 2020) to directly support FA companies. This allocation will allow promoting a defined field in FA under a certain criteria (e.g. Algae to Jet Fuel), where Israel has a competitive advantage and concentration of effort is needed. Criteria will be defined by FCI members and partners and could include: the social and economic impact of the particular innovation, time to market considerations, and the difficulty of certain subsectors in attracting investors.
3. Incorporating taxation instruments: Taxation benefits or reductions must be part of any plan, in order to make the FA sector more attractive to investments and new capital.
4. Creating and installing a facility in Israel to produce Bio/Synthetic fuel: This facility could complete gaps the value chain experienced by companies, by creating the platform for using all phases in the process of producing a fuel from a feedstock or synthetic fuel. This facility would ease the pressure on early-phase companies in the more capital-intensive stages of the innovation process. Priority of the chosen elements could be determined by the FCI & companies so the most urgent elements will be build first. The facility can be privately owned and operated or a PPP can be optional as well. Operational cost could be derived 50% from the company using the facility and 50% from FCI funds or other sources.
5. Creating an Offtake agreement: state agencies could commit to purchasing a certain amount of bio/synthetic fuel from Israeli companies. The agreement could be comprised of two phases: the first step would be a five year period, and the second step would be a ten year period, or until a certain level of usage in the capacity of Israel is reached. The purpose of this mechanism is to ensure demand for the companies' products, mitigating the risks for investors and companies themselves.

6. **Generating a Financial Model:** Creating a financial model with the goal of examine potential financial instruments (e.g. guarantees, loans, accelerated depreciation) and their effect on the cost of capital and availability of debt. An advantage of this process would be to examine the efficiency of the instruments used versus the cost of implementation. For example, using "cheaper" debt, extending the term, and gaining lower rate of interest could decrease total cost of interest by 46% and total cost of debt by 16%.²

² When comparing 40 million NIS debt at an annual interest of 8.5% for 10 years , and 40 million NIS at 2.5% for 20 years.



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