



USDA Foreign Agricultural Service

# GAIN Report

Global Agriculture Information Network

Template Version 2.09

Voluntary Report - public distribution

**Date:** 1/30/2009

**GAIN Report Number:** SW9001

## Sweden

## Bio-Fuels

# Bio-Fuels Cooperation- The Next Big Thing for FAS? 2009

**Approved by:**

Stephen Huete, Agricultural Counselor  
U.S. Embassy

**Prepared by:**

Stephen Huete, Agricultural Counselor

---

**Report Highlights:**

This report provides information on Embassy Stockholm's One Big Thing project, a prime model for effective Embassy action to promote government, research and business cooperation in advancing alternative fuels. This model can be replicated in other posts, and FAS can play a key role in this endeavor.

---

Includes PSD Changes: No  
Includes Trade Matrix: No  
Annual Report  
Stockholm [SW1]  
[SW]

**TABLE OF CONTENTS**

**EXECUTIVE SUMMARY:** .....3  
**BACKGROUND:**.....3  
**GOALS:**.....3  
**THE NEXT BIG THING:** .....4  
**USDA ROLE:** .....5  
**CONCLUSION:** .....6  
**USDA WEB -BASED RESOURCES** .....7

**EXECUTIVE SUMMARY:**

The "One Big Thing" of US Embassy Stockholm provides a successful model for Embassy and FAS actions in support of the President's National Energy Policy and the Energy Policy Act of 2005.

**BACKGROUND:**

The U.S. Embassy in Stockholm has set as its highest priority cooperation with Sweden to achieve a breakthrough in the development of alternative energy sources. Both governments share common goals in the energy security field and have ambitious programs to reduce their reliance on fossil fuels. President Bush set a national goal of replacing 75 percent of U.S. oil imports from the Middle East by 2025.<sup>1</sup> The government of Sweden also aims to reduce significantly its use of fossil fuel. The two nations are among the leaders in energy research and development, and Embassy Stockholm believes the two countries can better achieve their goals through cooperation in developing renewable energy sources and alternative fuels.

The initiatives by the two nations are a response to global climate change, rising petroleum prices, and concern about the availability of reliable energy supplies. The U.S. Embassy project, entitled "The One Big Thing (OBT),"<sup>2</sup> was launched by Ambassador Michael M. Wood in 2006 after extensive consultations within the embassy, in Washington with the State Department and the White House, and with various sectors in Sweden.

The project aims to achieve a breakthrough in production of alternative energies by stimulating U.S.-Swedish cooperation in four major areas:

1. technology, research and development;
2. financing and investment;
3. public awareness; and,
4. policies.

**GOALS:**

Embassy Stockholm set ambitious goals under each of the four areas above, and has accomplished most of those goals. These successes generally focused on using the unique position of the Embassy to bring together policy makers, entrepreneurs, small businessmen, researchers, investors, legislators and others from the United States, Sweden and on occasion other Nordic countries to investigate and commit to areas of cooperation, including business opportunities and cutting-edge applied research.

According to the Embassy, a few of the One Big Thing's successes since it was launched in September 2006 include the following:

- The Ambassador pledged to visit alternative energy sites throughout Sweden to assess the state of developments and identify possible partners for American investors or innovators. He visited all of Sweden's 23 regions in support of this goal.
- To encourage Swedish and American business partnerships, the Ambassador and the Commercial Service created a list of "investable" Swedish companies in the green technology sector. The list has now been updated and distributed four times, most recently in New York in September 2008. The list has been credited with drawing the

---

<sup>1</sup> Information about the U.S. National Energy Policy can be found at <http://www.doe.gov/about/nationalenergypolicy.htm>

<sup>2</sup> <http://stockholm.usembassy.gov/Environment/index.html>

attention of American investors and businesses to Swedish innovations and has resulted in a number of business opportunities for the Swedish firms.

- The Embassy was instrumental in bringing the U.S. Department of Energy, the Swedish Ministry of Enterprise and Volvo Corporation together in a \$12-million deal that will test hybrid trucks and efficient drive trains on Mack Trucks in the United States (Mack is owned by Volvo). The Department of Energy and the Swedish Energy Agency have also signed an agreement to jointly test metering systems for plug-in electric hybrid vehicles.
- Thanks to Embassy intervention, a small Swedish firm working to create jet fuel from biomass received \$5 million from the Defense Advanced Research Projects Agency to carry the research forward.
- Working with the State of Michigan, Swedish government agencies and the Departments of Commerce and Energy, the Embassy has launched cooperative projects in Flint Michigan (waste to gas) and Escanaba Michigan (black liquor gasification in pulp mills).

To maintain the Embassy's momentum, the list of goals has been updated annually. In 2008, special focus was placed on making Embassy Stockholm a significantly "greener" building, with high-efficiency light bulbs powered by electricity generated from renewable sources. A just-completed connection to the district heating grid will allow the Embassy to remove the existing oil burner. This switch will save an estimated 600,000kg CO<sub>2</sub> and \$70,000.0 annually. Embassy-owned housing is being converted to geothermal heating or district heating when possible.

In 2009, the Embassy will work to ensure that the One Big Thing continues after the departure of Ambassador Wood in January. Climate change policy will be a focus in the lead-up to the Swedish EU Presidency in the second half of the year. The Government of Sweden has stated that climate change will be a priority during its Presidency. In December 2009 a new international agreement will be negotiated to replace the Kyoto Protocol, and the U.S. will be looking to Sweden and Europe as partners in an effort to create a new comprehensive truly global agreement.

#### **THE NEXT BIG THING:**

One project that the OBT team has worked on, which holds great promise for alternative biofuels, is a joint venture between the Swedish firm Chemrec AB and the U.S. pulp producer NewPage Corporation. This joint venture will install a Chemrec black liquor gasification (BLG) facility in NewPage's pulp mill in Escanaba, Michigan, turning this 100 year old mill into a state of the art biorefinery.

BLG is a particularly interesting technology. Presently, most pulp mills are more-or-less energy neutral, getting all or most of the energy needed for operations from burning black liquor, a lignin-rich byproduct of the pulping process, in special boilers. However, this is an inefficient use of the energy in the black liquor. BLG involves subjecting the black liquor to high temperatures and high pressure, producing carbon monoxide, carbon dioxide, hydrogen, and methane. These gases can then be converted into alternative fuels (Fischer-Tropsch fuels and Dimethyl ether) through established, commercially available technology. BLG captures the energy in the waste product much more efficiently, and provides the mill an additional revenue stream.<sup>3</sup>

---

<sup>3</sup> More information on Chemrec's technology and the gasification process can be found at <http://www.chemrec.se/Technology.aspx>

A landmark study prepared by Princeton University, Politecnico di Milano, Navigant Consulting and the Georgia Institute of Technology<sup>4</sup> concludes:

In addition to the economic benefits to Kraft pulp/paper producers, biorefineries widely implemented at pulp mills in the U.S. would result in nationally-significant liquid fuel production levels, petroleum savings, greenhouse gas emissions reductions, and criteria-pollutant reductions. These are quantified in this study. A fully-developed pulpmill biorefinery industry could be double or more the size of the current corn-ethanol industry in the United States in terms of annual liquid fuel production. Forest biomass resources are sufficient in the United States to sustainably support such a scale of forest biorefining in addition to the projected growth in pulp and paper production.

The OBT team has been actively working to bring this project to fruition. The team brought business partners together and helped them overcome a number of hurdles. The team also worked to help the partners access government funding through established programs.

#### **USDA ROLE:**

USDA has a key role in the USG effort to develop alternative fuels. It brings to the table expertise from scientists and professionals from universities and research institutions all across the United States and its territories. Principal USDA agencies involved in research and development of bio-based fuels are:

- Agricultural Research Service (ARS), which is researching converting various sugars, starches, lignin and cellulose feedstocks, and fats and oils into fuels.
- Cooperative State Research, Education and Extension Service (CSREES), which is researching the use of agricultural materials for fuel.
- U.S. Forest Service (FS), performing research on the conversion of woody biomass into fuel and feedstocks.

USDA agencies also have programs to aid and encourage businesses to adopt new technologies:

- The FS' Woody Biomass Utilization Grant Program
- USDA Rural Development (RD) grant and loan programs to help businesses develop new technologies or install energy saving or biobased systems.

FAS field offices have a useful role to play in advancing renewable fuel initiatives. As the principal foreign affairs agency of the USDA and the representative of USDA to host governments, FAS has access to policy makers, legislators, businesses and researchers. This access allows field officers to bring people together, to help achieve the critical mass needed to advance technical development.

One example of the role FAS plays is the Chemrec-NewPage BLG project. The Stockholm OTB team worked hard to move the project along. When the joint venture came to the point of needing financing, the Stockholm Office of Agricultural Affairs connected it with the USDA Rural Development – Energy Office, which manages USDA's loans and grants program for businesses.

---

<sup>4</sup> "A Cost-Benefit Assessment of Gasification-Based Biorefining in the Kraft Pulp and Paper Industry," Volume 1 Main report, Eric D. Larson, Stefano Consonni, Ryan E. Katofsky, Kristiina Iisa, W. James Frederick, Jr, prepared for the U.S. Department of Energy and the American Forest and Paper Association, December 21, 2006.

Advancing the energy agenda is beyond the ability of any one agency. In overseas embassies, FAS will have to work with State, the Foreign Commercial Service, and others. FAS has a proven record of excellent cooperation with other agencies to advance the commercial interests of US agriculture.

**CONCLUSION:**

It is indisputable that the United States' economy is facing a great challenge with regard to energy. It is estimated that world energy demand will increase 50 percent by 2030 from 2005.<sup>5</sup> Oil and natural gas will meet more than half of future needs. Yet petroleum is a non-renewable natural resource; sometime this century the world will reach "peak oil", the point at which global maximum oil extraction is reached and production enters terminal decline. (Some analysts believe that we have already hit peak oil.) As production declines, prices will necessarily rise.

There is an urgent need to find alternatives that match petroleum's advantages of high energy content and easy transportability. Biofuels can be this alternative. Speedy development of new technologies requires effective cooperation among a broad range of researchers, including those in other countries.

Sweden's One Big Thing is a prime model for effective Embassy action to promote government, research and business cooperation in advancing alternative fuels. This model can be replicated in other posts, and FAS can play a key role in this endeavor.

---

<sup>5</sup> "The Truth About Oil and Gasoline: An API Primer," American Petroleum Institute, September 19, 2008, p. 30.

**USDA Web-Based Resources**

USDA Energy page:

[http://www.usda.gov/wps/portal/!ut/p/s.7\\_0\\_A/7\\_0\\_1OB?navid=ENERGY](http://www.usda.gov/wps/portal/!ut/p/s.7_0_A/7_0_1OB?navid=ENERGY)

USDA Energy Matrix:

<http://www.usda.gov/rus/index2/0208/EnergyPrograms.htm>

Agricultural Research Service (ARS) Bioenergy and Energy Alternatives National Program:

[http://www.ars.usda.gov/research/programs/programs.htm?NP\\_CODE=307](http://www.ars.usda.gov/research/programs/programs.htm?NP_CODE=307)

Cooperative State Research, Education and Extension Service (CSREES) Biobased Products and Processing Program:

<http://www.csrees.usda.gov/biobasedproductsprocessing.cfm>

Forest Service (FS) Woody Biomass Utilization:

<http://www.fs.fed.us/woodybiomass/index.shtml/news/index.shtml>

Rural Development Title IX Programs:

<http://www.rurdev.usda.gov/rbs/farbill/index.html>