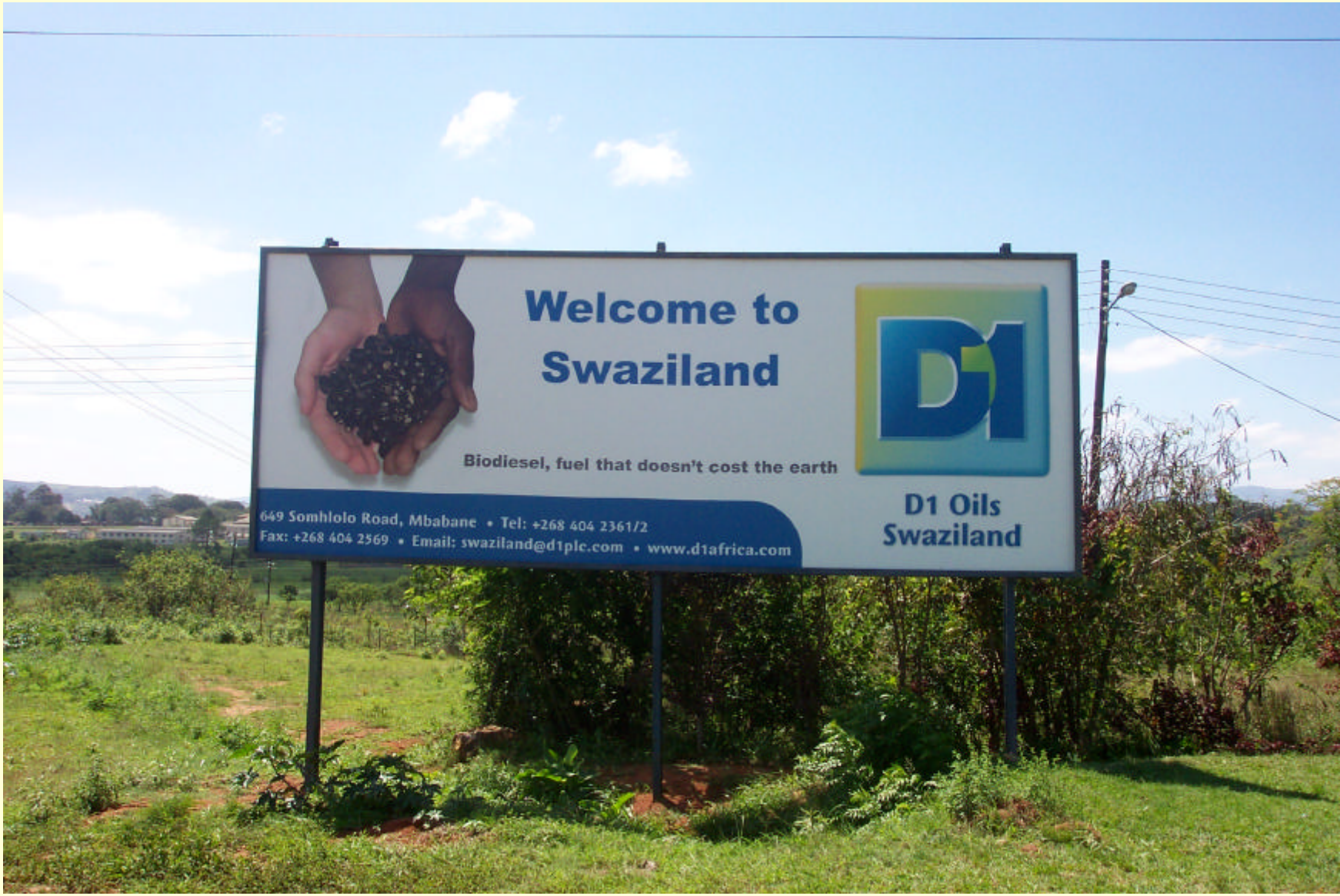
Key drivers agrofuel policies

- European farmers
- Car industry
- Agrofuel industry
- Biotech (enzyme) industry
- Increasingly: wood, pulp and paper industry
- Oil industry and utilities

New industry alliances, for example:

- Shell – Choren: second generation BTL (synthetic fuel from wood residue)?
- BP – D1 oils: BP-D1 oils Fuel Crops limited
  D1 oil involved in biopiracy scandal relating to Jatropha-genetic material from Indira Ghandi University, India. D1 oils has now 172.000 hectares Jatropha plantations. “Joint venture will have exclusive access to elite jatropha seedlings produced by D1 oils”
- BP-British Sugar-DuPont: new plant local wheat for ethanol and biobutanol.
- Volkswagen, Daimler and Choren: Biomass to Liquid (BTL) second generation. “Driving Ideas” campaign.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Industry and CO2 emission reduction

- Oil industry: Shell says to favour CO2-based targets over volume-targets. But oil industry heavily lobbied against Fuel Quality Directive
  Argument Shell: FQD no mention of economic incentives. “CO2 emission reductions from biofuels should get financial rewards.”

- Car industry: ACEA “working to cost-effective policy to cut carbon emissions from cars”. Support 120 grams but 130 grams/km is “not feasible”. “Placing the burden on the car industry is the most expensive”.

European agrofuel industry

European Biodiesel industry (4.9 million tonnes 2006 = 77% of biodiesel world wide; 50-60% growth 2005/6; 185 plants operational, 58 under construction) in trouble:

- European Biodiesel Board anti-dumping and anti-subsidy complaint to European Commission against US B99 imports. European biodiesel industrial capacity “underutilised”, and “production may start stagnating if not declining already as from this year 2007”.

  EBB demands mandatory targets and increase biodiesel content of EN 590 from 5% to 10% (opposition car manufacturers)?

European ethanol (1.2 million tonnes 2006; EU exports gasoline) Some private investment also second generation (Nedalco)?

- Worried about possibility lower tariffs Brazilian ethanol. Especially Sweden argues for lower tariffs.

How much agrofuel will be used?

EU energy outlook 2000-2030:

- **Private cars 1,2% per year**
- **Public road transport: 0.4%**
- **Rail transport: 0.9%**
- **Aviation: 3.8%**

- **EU agrofuel use 2006: 2006, 5.38 million tons oil equivalent (Mtoe)?**

EBTP estimate EU agrofuel use by 2020:

- **14%: 43 Mtoe.**

DG Agri estimate agrofuel use:

- **10%: 34.6 Mtoe**

Import/export scenario’s

- Heavily depending on outcome Renewables directive and Fuel Quality Directive
- DG TREN counts on a 50-50 scenario

If the 50-50 scenario is roughly correct, and diesel-gasoline mix is also 50-50, then 8.3 Mtoe sugar cane ethanol would be needed**.**

Last season’s production of Brazilian ethanol was **8.9 Mtoe**

This means that in this scenario, nearly the entire current sugar cane ethanol production in Brazil would be needed by 2020.

Research and Technology

- Strategic Research Agenda shaped by industry through the European Biofuel Technology Platform. (“BiofuelTP”): 25% agrofuel target by 2030
- EU-Brazil research agreement: second generation 'agricultural waste'. European Renewable Energy Council: “Hope they do not forget first generation”.
- GM Trees: SweTree Technologies (board member also CEO of Stora Enso, pulp and paper giant, and board WWF). Part owner: Sveaskog, which is on the BiofuelTP

Industry members European Biofuels Technology Platform

- **Car manufacturers**
  Daimler AG, Germany
  General Motors Europe, GERMANY
  PSA Peugeot Citroen, FRANCE
  IDIADA Automotive Technology SA, Powertrain Department, SPAIN
  Volkswagen AG Wolfsburg, GERMANY
  Toyota Motor Europe, Powertrain Engineering Division, BELGIUM
  Volvo Technology Corporation, SWEDEN
  FEV Motorentechnik GmbH, GERMANY
  Centro Ricerche FIAT (FIAT Powertrain Technologies), ITALIA
  Instituto Motori CNR, ITALIA
  Renault Research Division, FRANCE
  Caterpillar Motoren GmbH & Co. KG, Kiel, GERMANY
  MAN Nutzfahrzeuge AG, GERMANY
  Ford Forschungszentrum Aachen GmbH, Germany
  EUCAR European Council for Automotive R&D, BELGIUM

- **Oil industry:**
  CONCAWE, BELGIUM/INT
  TOTAL
  PREEM, SWEDEN
  Repsol YPF, S.A., Corporate Identity, SPAIN
  PKN Orlen, POLAND
  OMV Aktiengesellschaft, AUSTRIA
  Shell Global Solutions International BV, THE NETHERLANDS
  IFP, Institut Francais du Petrole, France
  TallOil AB, SWEDEN
  Svenska Petroleum Institutet, SWEDEN

- **Agrofuel/agro-energy:**
  European Biodiesel Board (EBB)
  Abengoa Bioenergy (Services, Electricity, water privatisation)
  BDI-BioDiesel International AG, AUSTRIA
  CHOREN Industries GmbH, GERMANY
  NOVAOL Srl, ITALY
  FramTidsbränslen Sverige AB, SWEDEN
  Bundesverband BioEnergie eV (BBE), GERMANY
  eBio - European Bioethanol Fuel Association, BELGIUM

- **Forestry/pulp/paper:**
  UPM-Kymmene Corporation
  Sveaskog, Sweden (part owner of SweTree technologies)
  SÖDRA, Sweden
  Vapo Oy, Finland

- **Biotech/seed companies:**
  KWS Saat AG
  EuropaBio
  Syngenta Seeds Ltd

- **Farmers associations:**
  Fédération Française des Producteurs d'Oléagineux et de Protéagineux FRANCE
  Danish Agricultural Council
  Südzucker AG Mannheim/Ochsenfurt, GERMANY

- **Enzymes/biotechnology**
  Genencor International (US)

- **Vegetable oils / Grain traders:**
  Neste Oil, FINLAND
  ADM European Management Holding GmbH, GERMANY
  BUNGE, FRANCE
  Cargill Sweeteners Europe, BELGIUM
  Organisation Nationale Interprofessionnelle des Oleagineux
- **Electricity/energy:**
  DONG Energy, Denmark

- **Chemical:**
  BASF Aktiengesellschaft, GERMANY

- **Hydrogen/gases:**
  Air Liquide, FRANCE

Issues with Life-Cycle GHG Emissions

Land-use change

- Positive GHG balances assume that biofuel crops come from “set-aside” areas or unharvested grass
- Demand will significantly increase pressure to convert land to agriculture
- If land is cleared, it would take 60 - 270 years of growing biofuels to offset initial CO_2 release *
- Significant **indirect and macro effects**:
  - Difficult, if impossible, to quantify and include in analysis
  - i.e. Corn crops displace soya crops, which then are planted in deforested area. Study shows rate of Amazon deforestation in direct correlation with world market price of soy **
  - i.e. According to FAO, increased use of rapeseed oil for biodiesel/PPO increases demand for palm oil in food industry

* The King Review of low-carbon cars, Oct 2007