

**Deriving effective least-cost policy strategies for
alternative automotive concepts and alternative fuels**

(ALTER-MOTIVE)

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ALTER-MOTIVE

- **Coordinator:**
- EEG, Vienna University of Technology

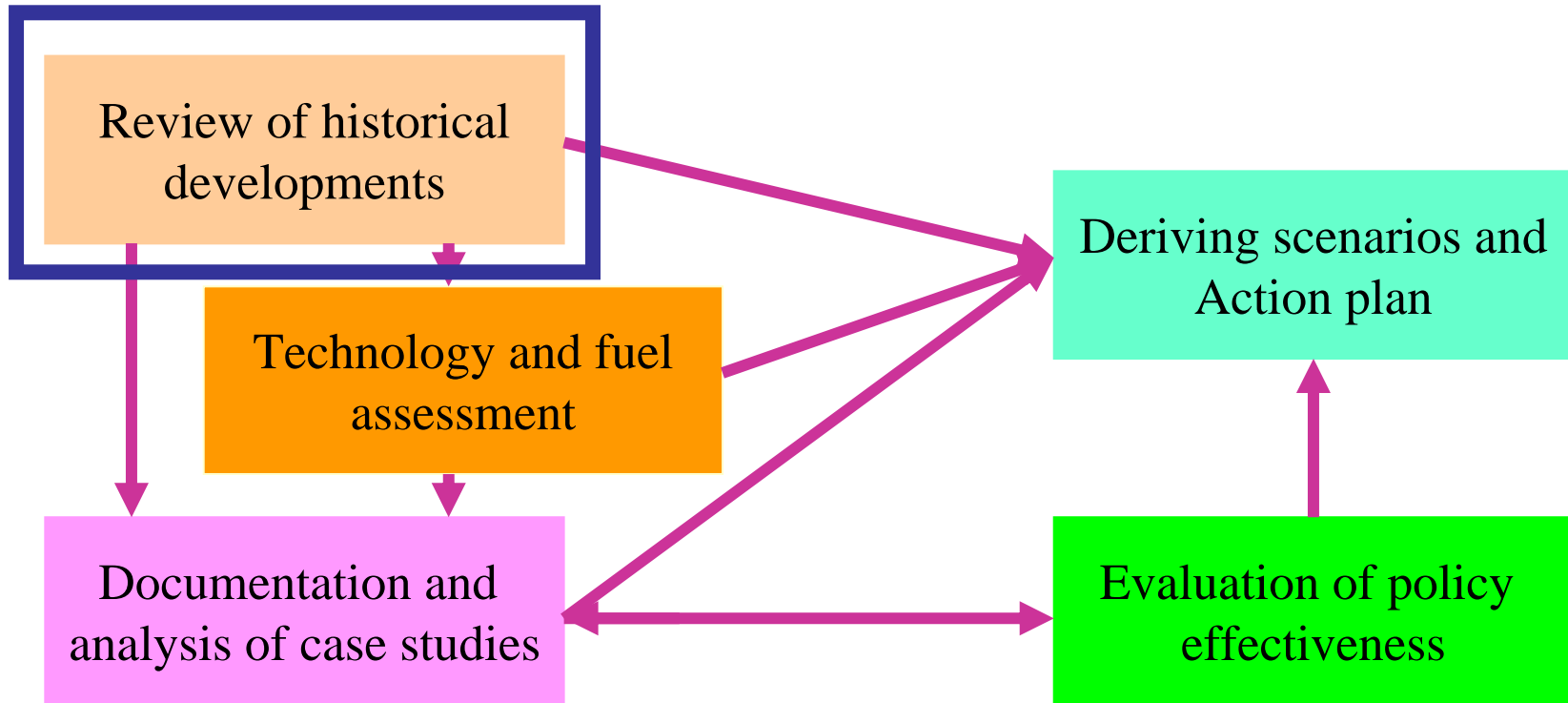
- **Partners:**
 - Stichting Energieonderzoek Centrum Nederland, The Netherlands
 - Eni Corporate University S.P.A., Italy
 - IREES, Germany
 - Wuppertal Institut für Klima, Umwelt, Energie GmbH, Germany
 - AEOLIKI Ltd, Cyprus
 - Black Sea Energy Center, Bulgaria
 - Association Rhônealpiénergie-Environnement, France
 - Centre for Renewable Energy Sources, Greece
 - Stowarzyszenie The Kraków Institute for Sustainable Energy, Poland
 - Chalmers Tekniska Högskola Aktiebolag, Sweden
 - Forschungsgesellschaft Mobilität-Austrian Mobility Research, Austria
 - Sociedade Por Quotas CEEETA-ECO, Portugal
 - Det Økologisk Råd (EcoCouncil), Denmark

- **Duration:**
1 October 2008 - 31 March 2011

Objective of the Project **ALTER-MOTIVE**

- The **core objective** of the project ALTER-MOTIVE is to derive effective least-cost policy strategies to achieve a significant increase in alternative fuels and corresponding alternative more efficient automotive technologies to head towards a sustainable transport system.
- The **heart of this project** is an investigation of about 80 recently implemented successful case studies of pilot projects for marketing alternative automotive technologies (AAMT) and alternative fuels (AF).
- Furthermore, prospective **scenarios** on the future deployment of AF & AAMT will be developed, showing how to meet EU targets with least-cost for EU citizens based on efficient & effective policy mixes.

Project Overview



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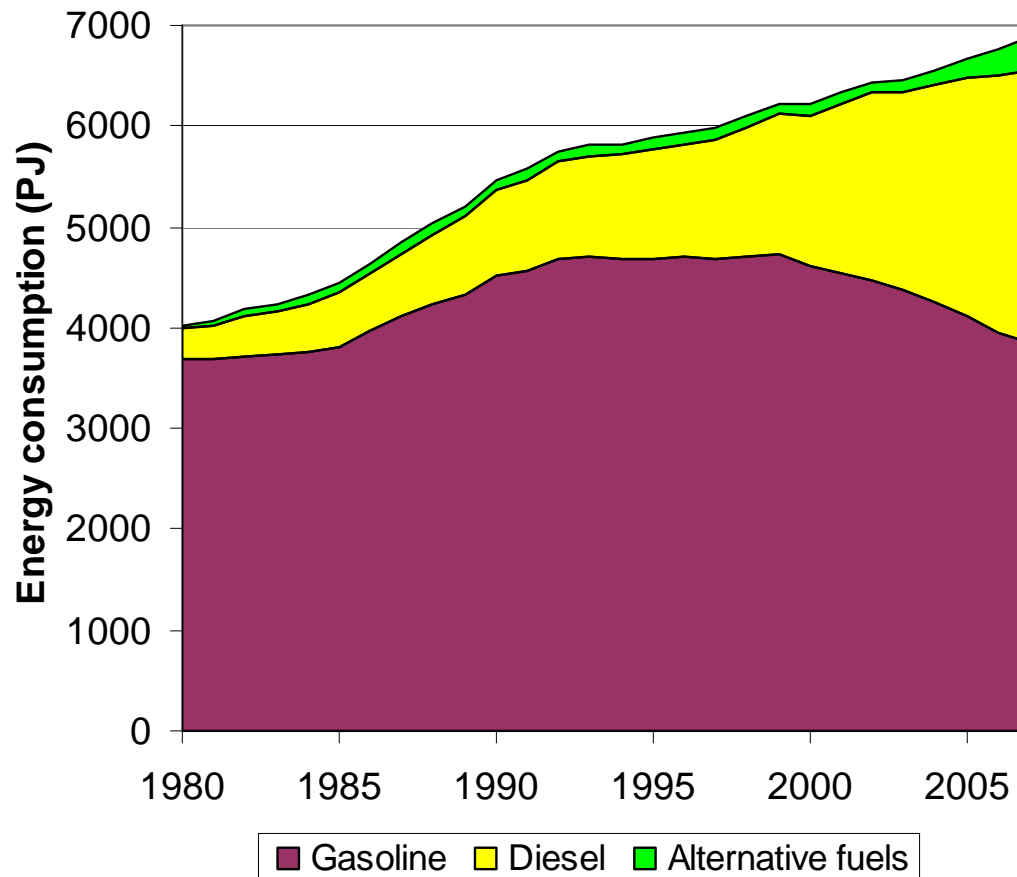
Review of historical developments

Cross-country comparison of the major indicators in EU

In detail the development of the following features is documented:

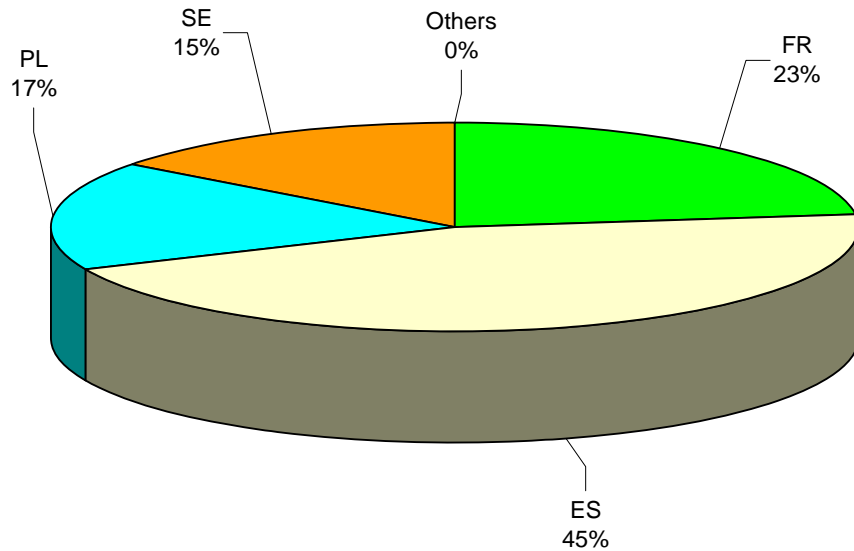
- *Amount of fuel used* (energy consumption of passenger cars)
- *Biofuels consumption and production,*
- *Fuel price,*
- *Vehicle stock* (including the number and type of vehicles),
- *Travel activity* (vehicle-km driven),
- *Fuel intensity* (litre/100 km)
- *Policy instruments implemented* (types of taxes, tax levels and tax incentives, CO₂-dependent policies, subsidies...)

Energy consumption of passenger cars



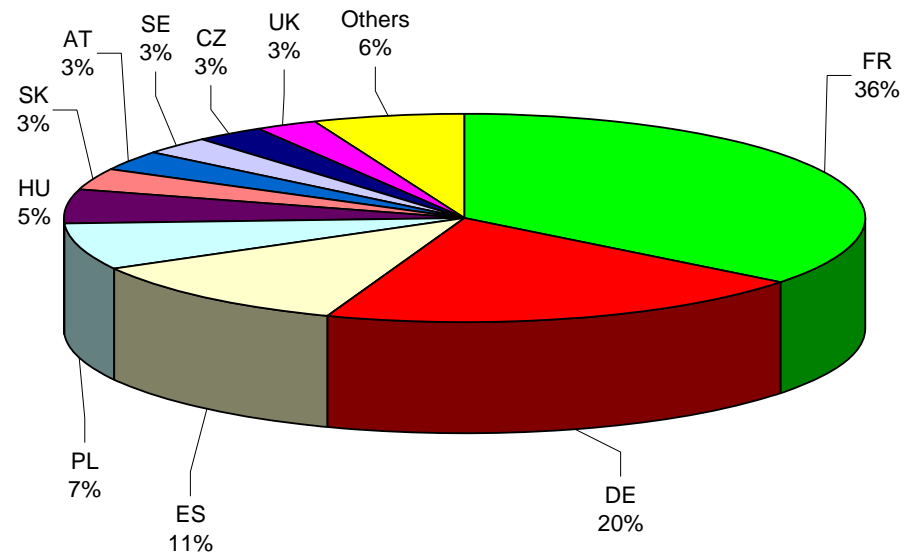
Energy consumption in car passenger transport in EU-15 by fuel, 1980 – 2007

Bioethanol production in EU-27



Country shares of bioethanol production
2003 in EU-27 countries

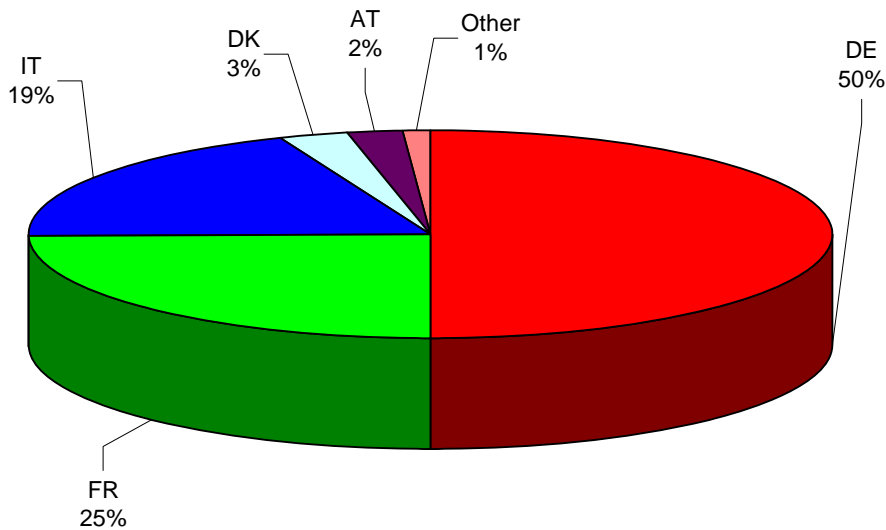
9 PJ



Country shares of bioethanol production
2008 in EU-27 countries

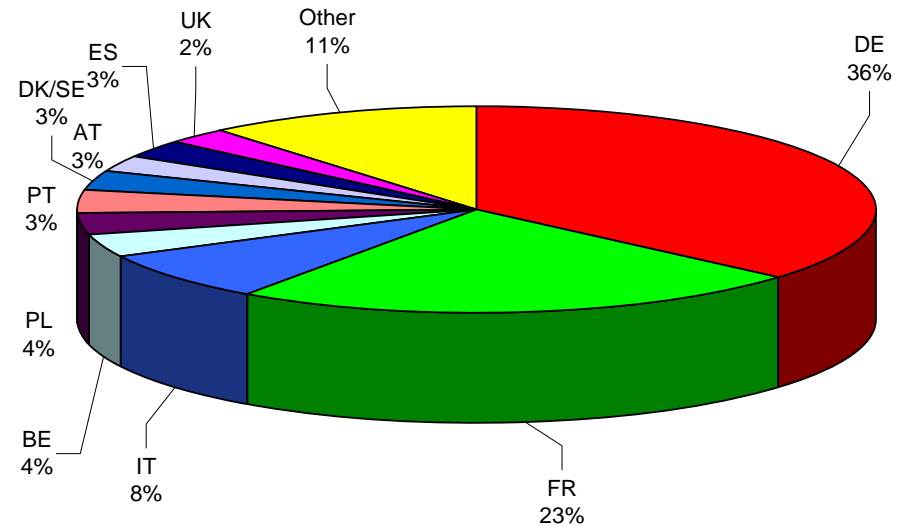
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Biodiesel production in EU-27



Shares of biodiesel production 2003 in EU-27 countries

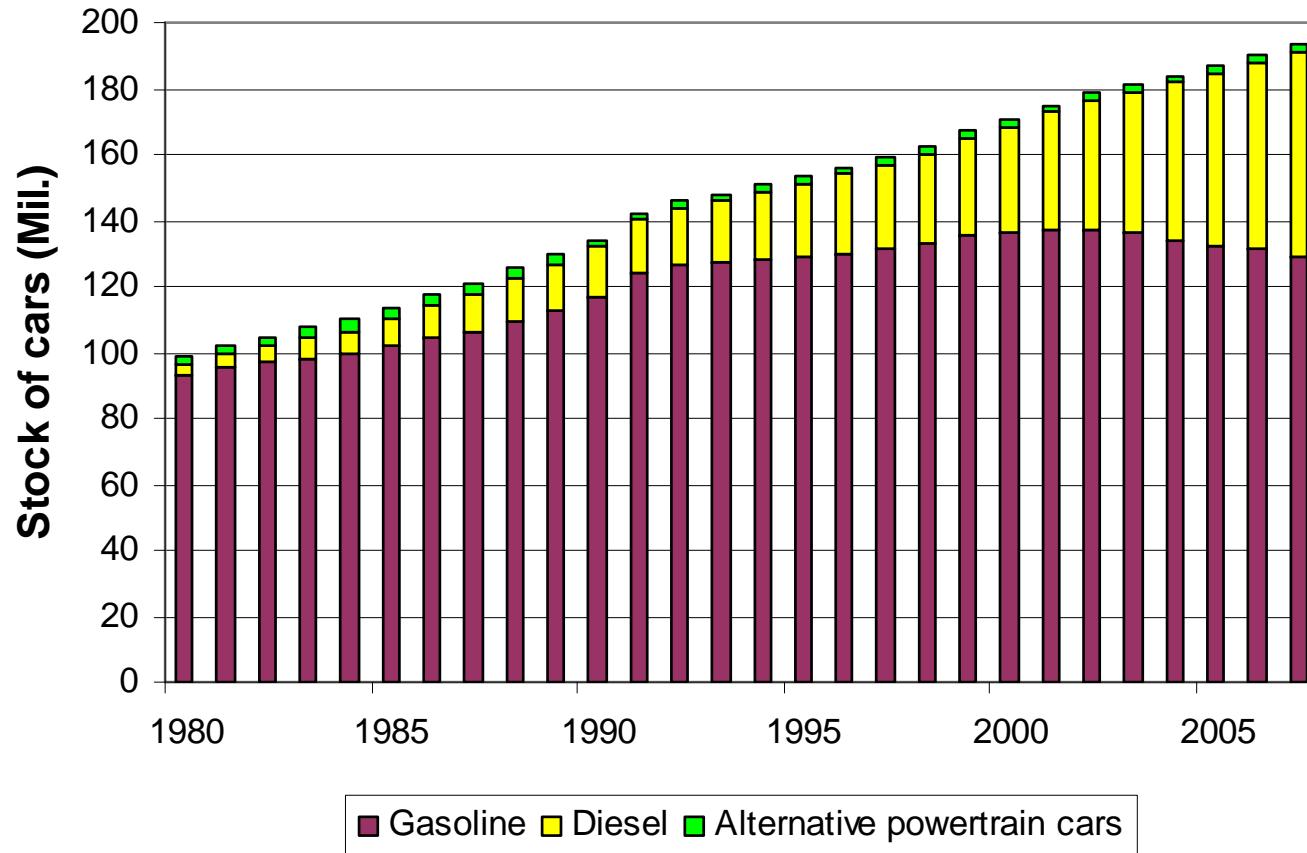
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Shares of biodiesel production 2008 in EU-27 countries

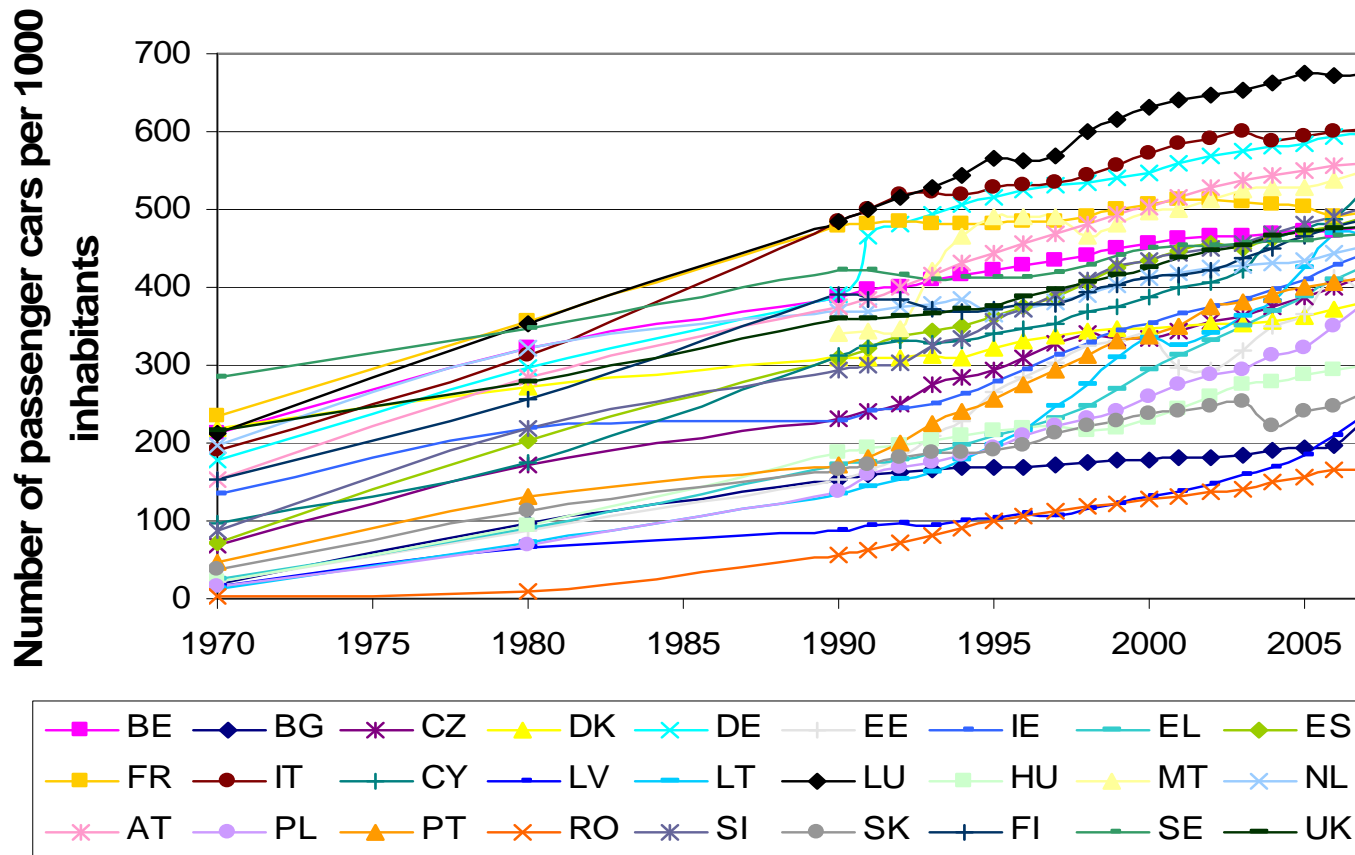
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Development of car stock



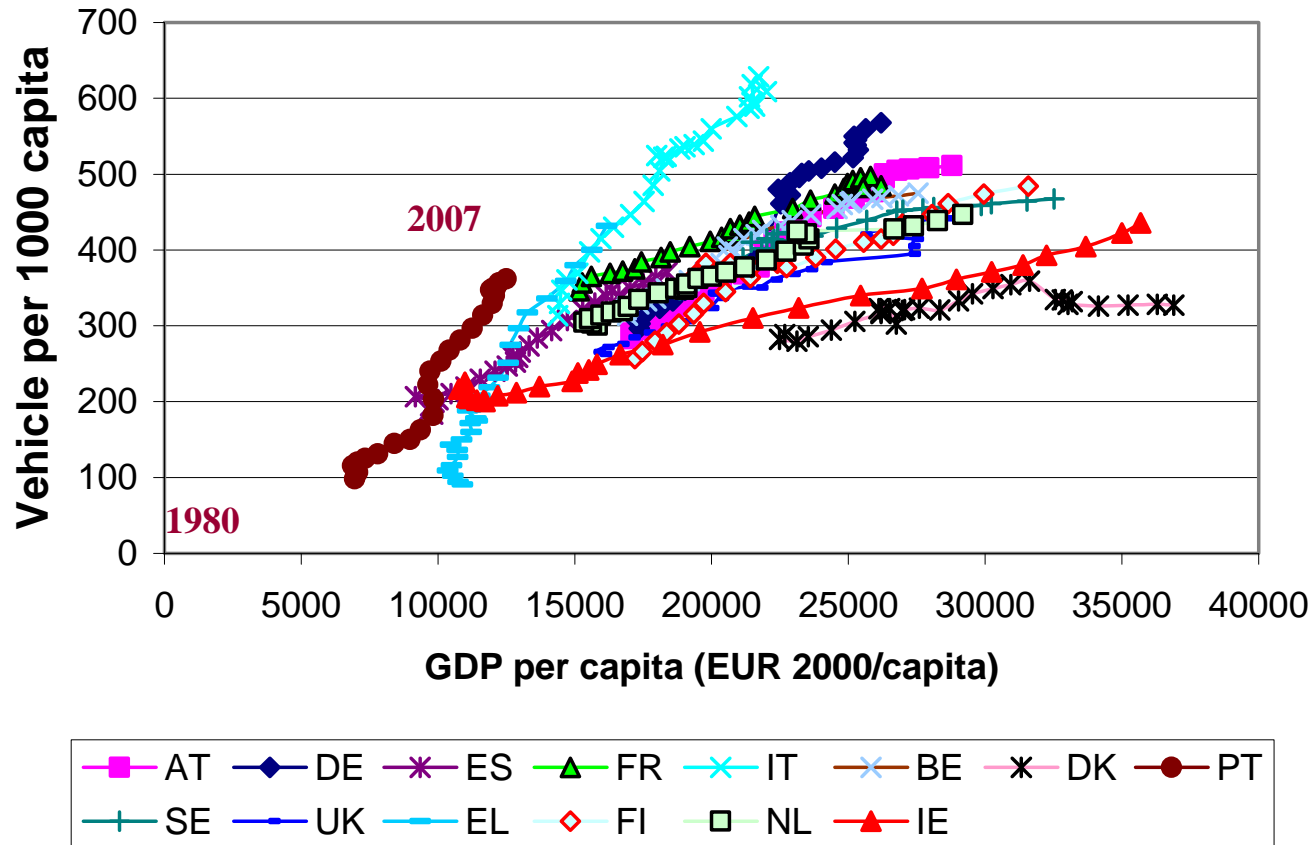
Development of car stock in passenger transport in EU-15, 1980 – 2007

Development of car stock



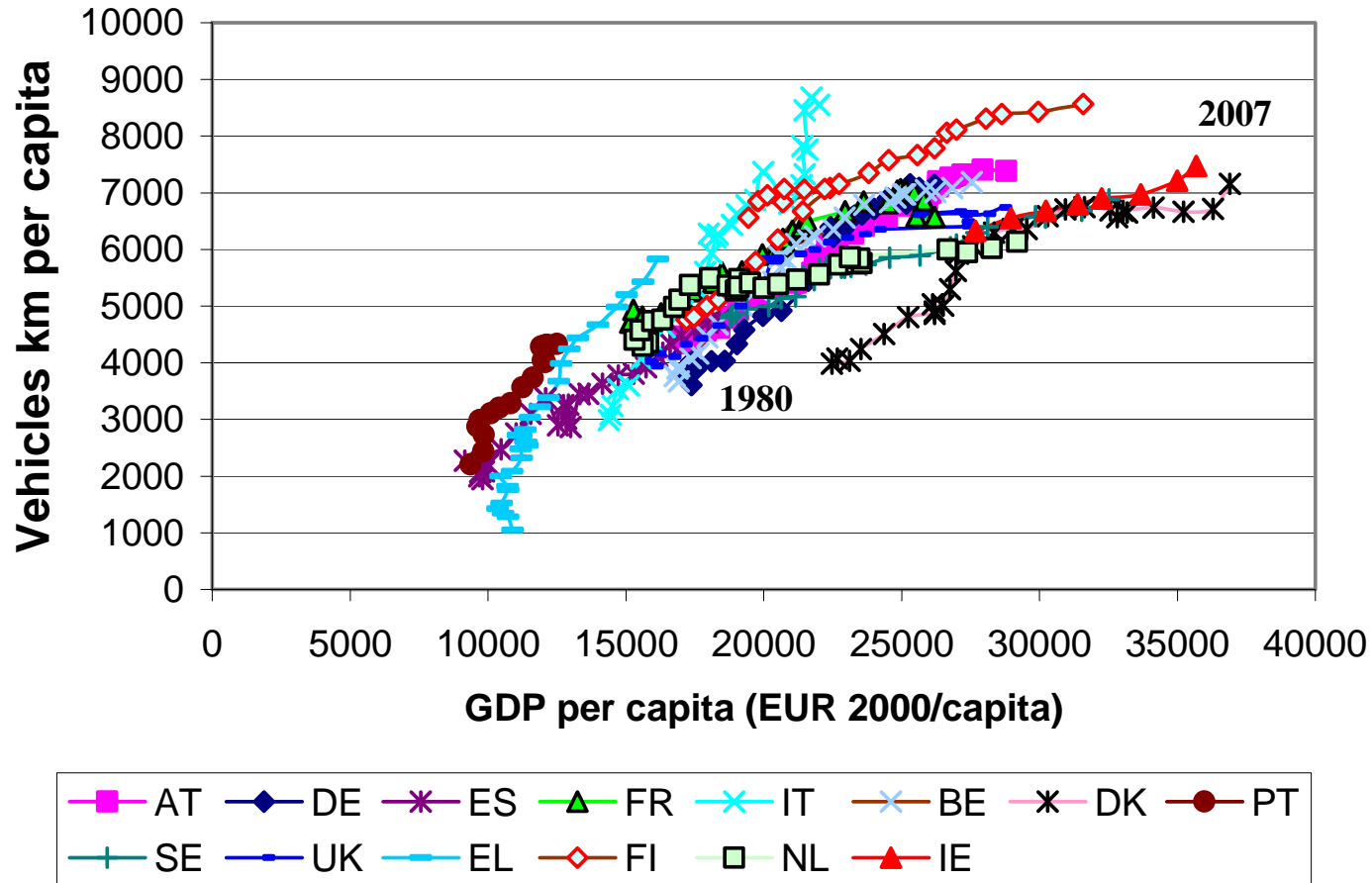
Development of car ownership per 1000 capita in EU- 27, 1970 – 2007

Development of car stock



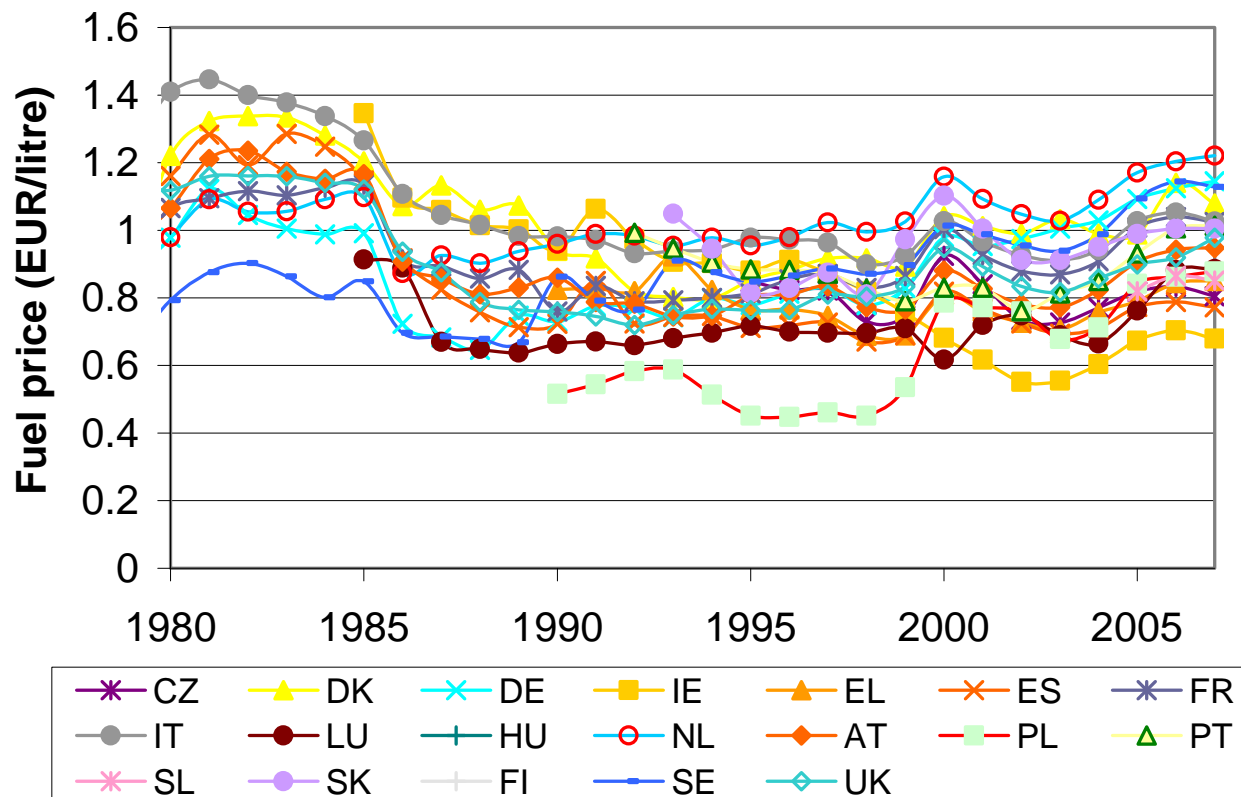
Car ownership versus GDP per capita 1980-2007

Development of vehicle-km driven



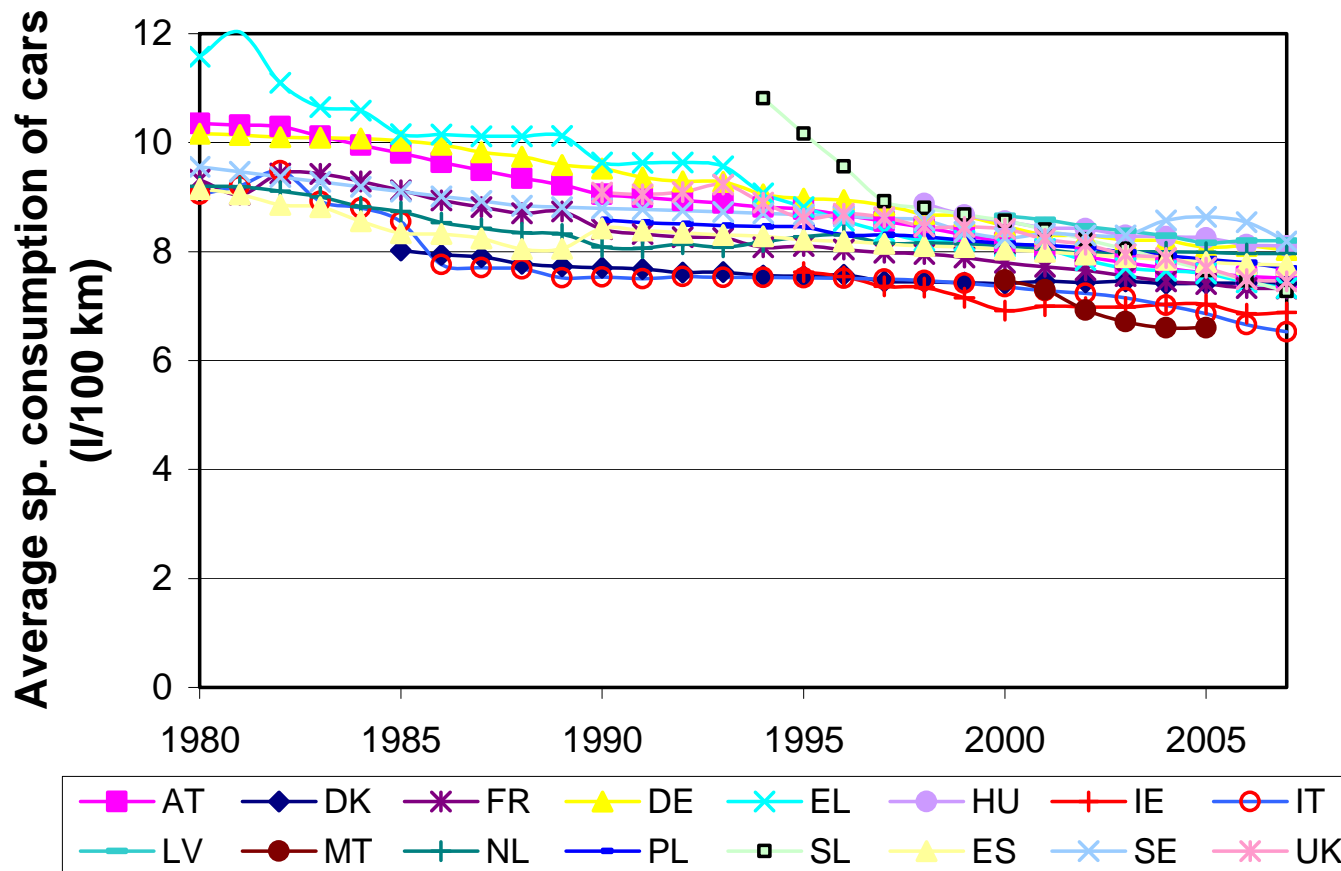
Development of vehicle kilometer per capita in selected EU countries 1980-2007

Development of fuel price



Fuel price (including all taxes) for selected countries 1980 – 2007

Fuel intensities



Average on road fuel intensity of stock of cars, gasoline equivalent

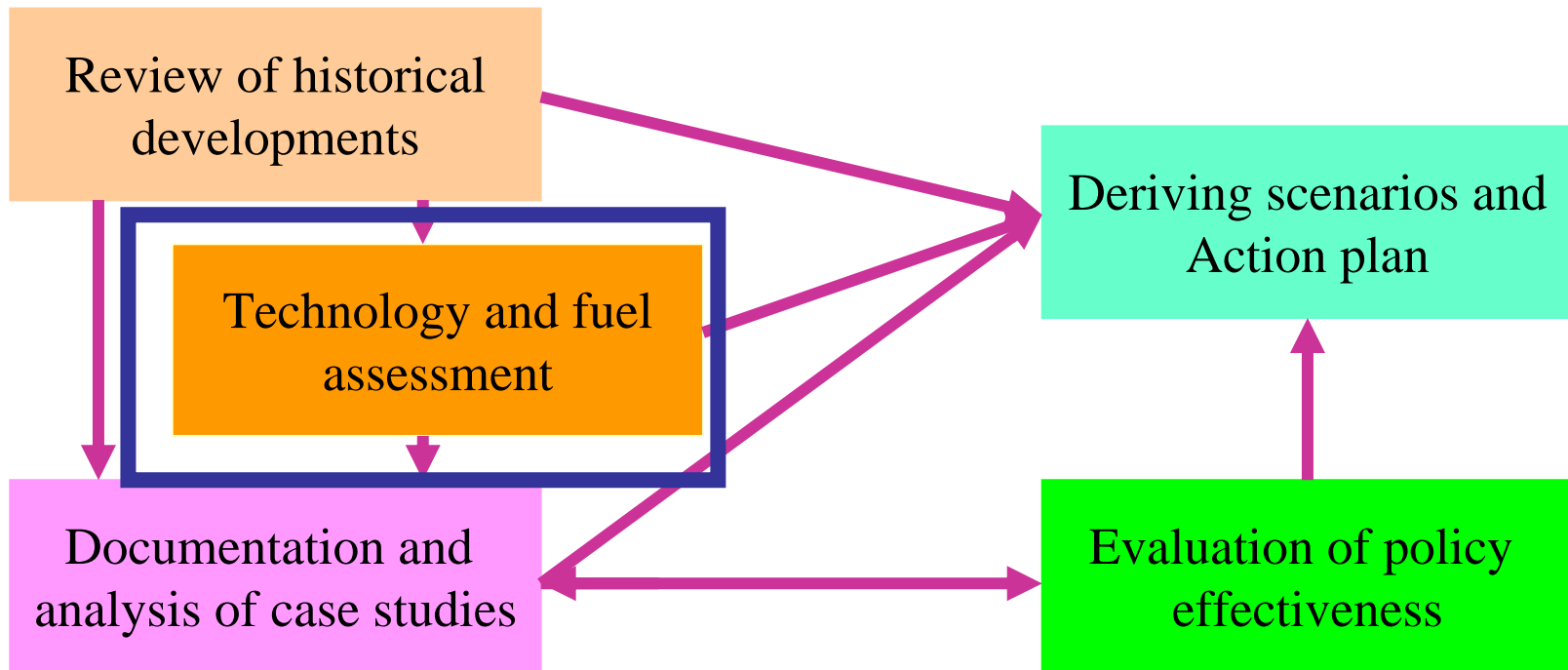
(Diesel and LPG are converted to liters of gasoline at their energy content. 1 litre diesel = 1.12 litre gasoline)

Review of historical developments

The major (preliminary) conclusions are:

- Registration and ownership tax system
- Fuel taxes
- Regarding alternative fuels
- Regarding alternative automotive systems

Project Overview



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Technology and fuel assessment

Comprehensive ecological, economic and technical/energetic assessment of all AF&AAMT

- WTT assessment
 - TTW assessment
 - Supply side potentials
 - Technical efficiency improvement / innovation potential
-to avoid the promotion of wrong paths!

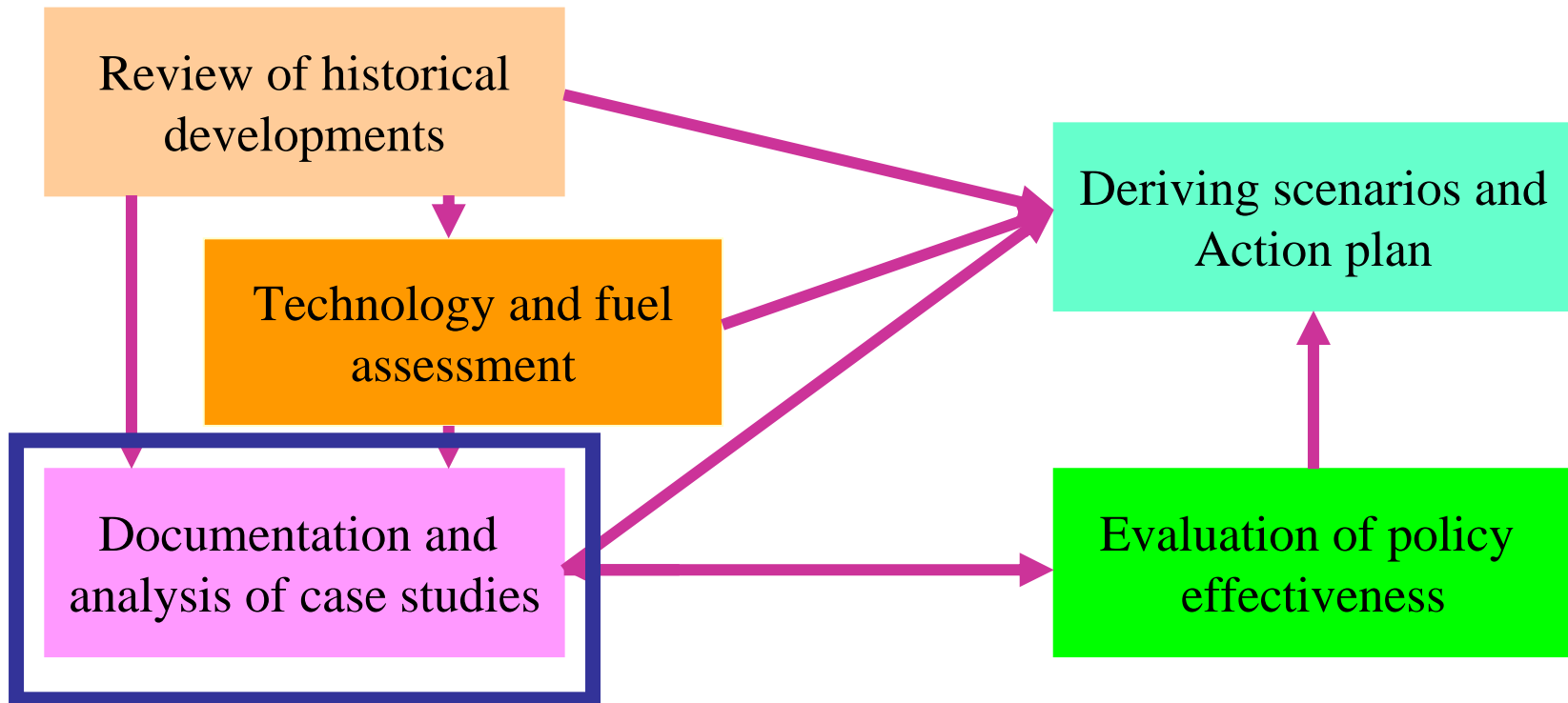
Economic assessment and potential of alternative fuels and alternative technologies

Felipe Toro (IREES, Germany)

Ecological assessment of biofuels, hydrogen and electricity in transport

Sandro Furlan (ENI, Italy)

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Case studies

(BIO) gas local fuel station

The biogas processing unit plus biogenic CNG filling station in Margarethen am Moos is the smallest commercially run facility of its kind anywhere in the world. Its simple, compact design has advantages both for operation and economically.

Background

The project (BIO) gas local fuel station lasted from January 2007 to September 2008. The upgrading plant and the local fuel station were implemented in Margarethen am Moos near Schwechat at the site of a 500kW biogas plant. The biogas plant delivers the additional biogas that is converted into fuel by simply increasing its biomass input. This project was initiated by TBB Consulting in cooperation with EVM (Energie Versorgung Margarethen am Moos), Vienna University of Technology, AGRAR PLUS, AXIOM, BAUER-Poseidon (fuel station), FIAL and LUKENEDER.

Major targets

The goal of the project (BIO) gas local fuel station was to erect Austria's first biogas-upgrading plant in connection with a local fuel station without any connection to a natural gas grid. The proper technique for the local upgrading plant is the membrane technique. With an average turnout of 33 Nm³ biomethane (methaPUR) it is the smallest commercially running upgrading plant in Europe. Throughout the project the membranes could always deliver the needed gas-quantity and gas-quality. The upgrading plant also was capable to operate in the supply on demand modus, by turning off/on when needed. The offgas from the upgrading plant is reinjected into the biogas plant and converted into heat and power by the installed gas engine. This makes the

Major results and lessons learned

The project goal has been achieved completely. Currently the fuel station has about 30 customers. From the beginning the project was funded by the Land NÖ as well as ÖKK and FFG. The total costs of the project of about 642.000 EUR (442.000 investments costs and 200.000 operation and maintains costs) are covered mostly by FFG (94.000 EUR), Land NÖ (150.000 EUR) and ÖKK (143.650 EUR). The remaining costs were paid by the operator of the plant, the EVM. The public was informed about this project through different activities such as presentations, nomination for Klimaschutzpreis 2008, as well as the win of the NÖ Energy Globe 2008. After the success of demonstration-plant in Margarethen am Moos it is now planned, to find 25 more locations in Austria to construct an upgrading plant and a local fuel station similar to Margarethen am Moos.

More information

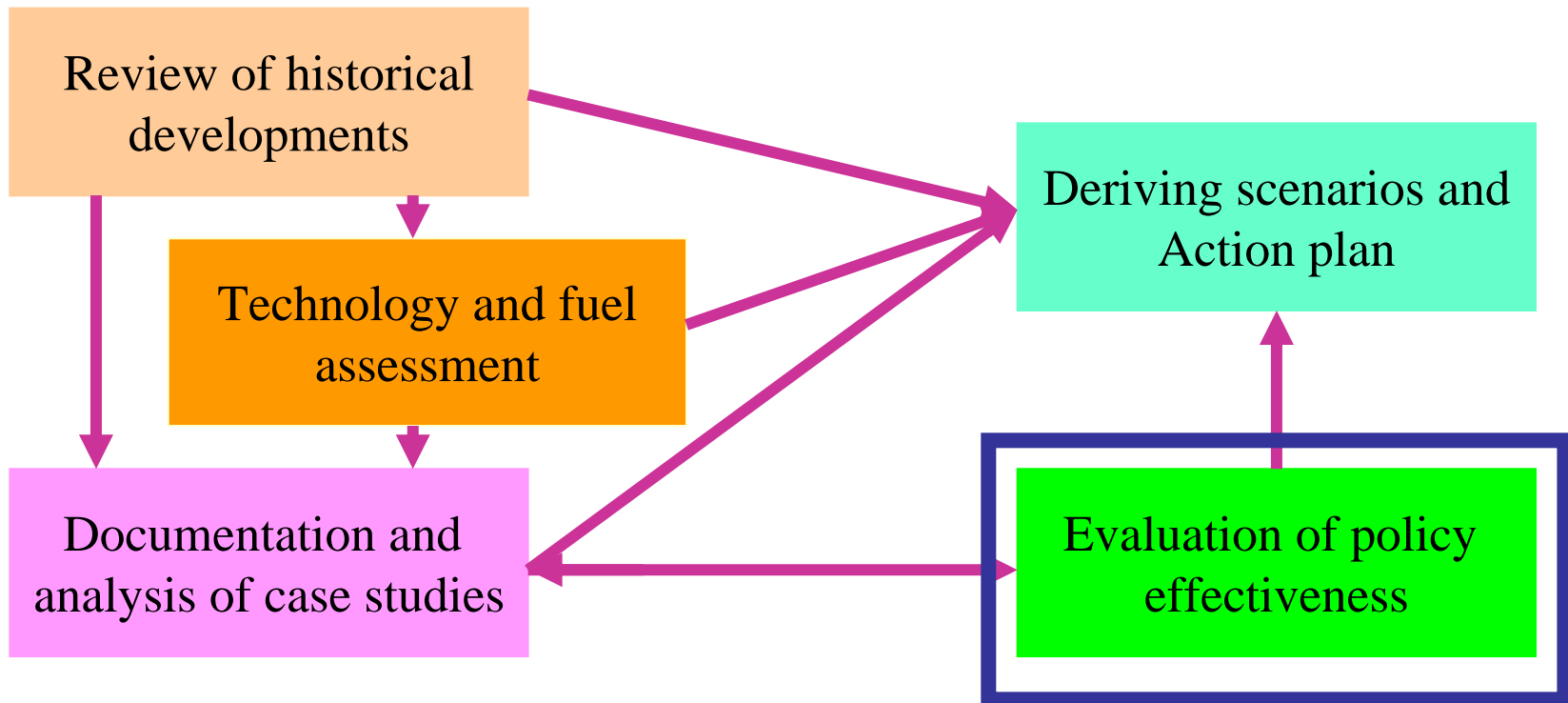
TBB Consulting
DI Harald Bala MSc

www.methapur.com

Lessons learned from empirically implemented case studies: Identification of success parameters

Gerfried Cebrat/Claudia Anacker (FGM-AMOR, Austria)

Project Overview



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Evaluation of policy effectiveness

- To find out which policy instruments are most appropriate in which technological development phase
 - Which instruments are available?
 - How about their effectiveness?
- ➡ Development of a validated toolbox that can be used to identify the most suitable policy instrument for a certain technology at a given point of development

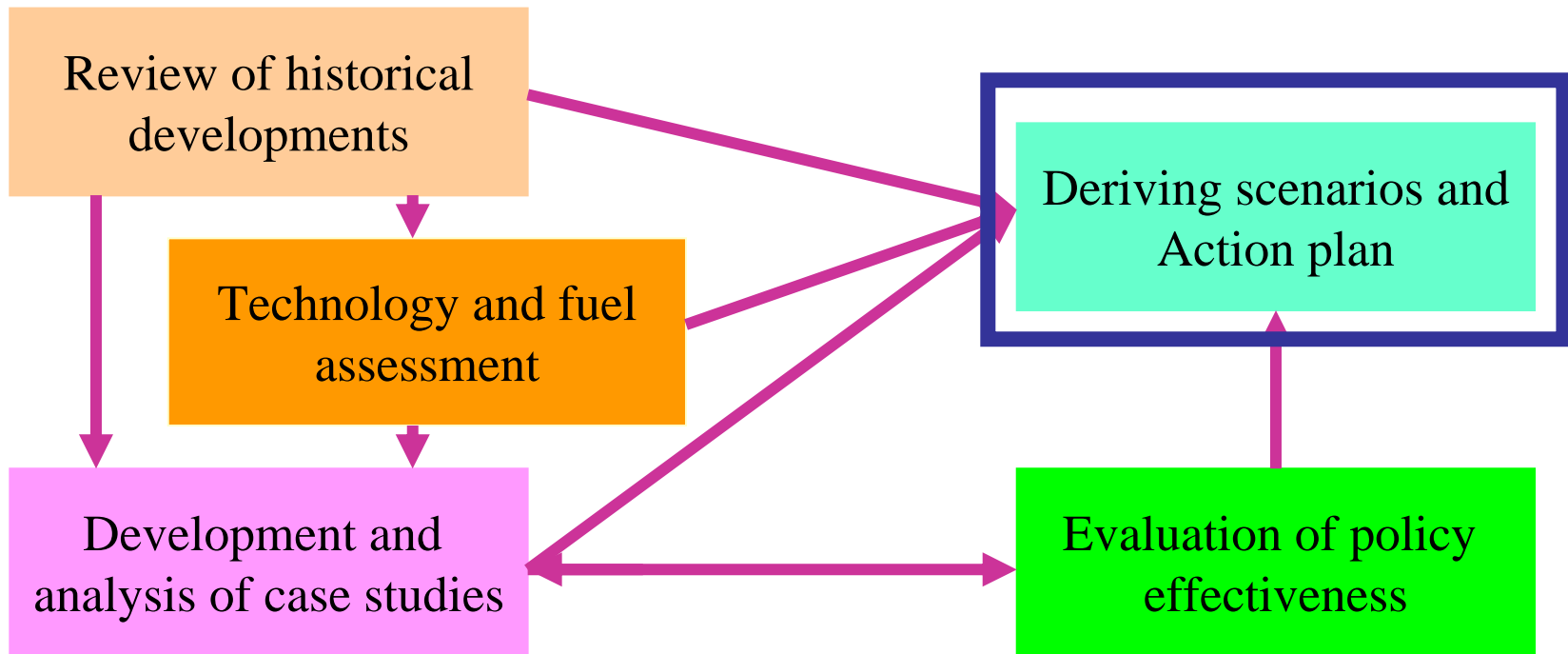
Which policies are proper / necessary for bringing about the desired changes in passenger transport?

Ingo Bunzeck (ECN, The Netherlands)

Copy & Paste Policies?! An analysis of the transferability of successful local and national policy measures related to alternative fuels

Ynke Feenstra (ECN, The Netherlands)

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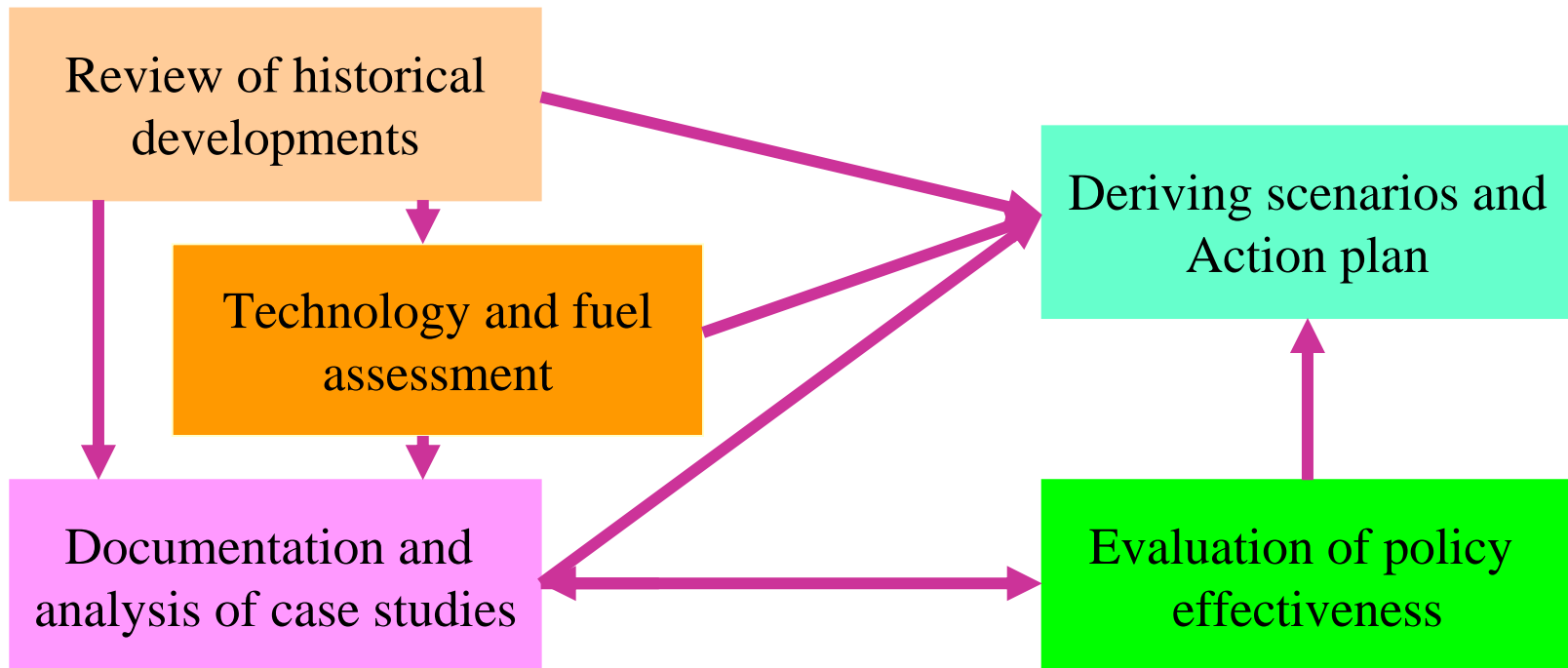
Deriving scenarios and action plan

- ... to derive scenarios and to formulate precise and concrete recommendations in an action plan
- The scenarios derived for selected EU countries will show which developments are possible in the next years if the proper policies are implemented.
- Moreover, these scenarios will also allow to identify the least-cost strategies. A final outcome will be a detailed action plan especially suitable for policy makers for Europe as a whole and for specific regions and countries.

Summing up: Deriving an action plan for heading towards a more sustainable passenger car transport system in EU-countries

Reinhard Haas (EEG, TU Wien, Austria)

Project Overview



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www.alter-motive.org

National workshops:

- 22.04.2010, Greece - *“Transferring good experience for other countries”*
- 17.05.2010, Italy - *“Alternative fuels and vehicles: solution for sustainable transport policy”*
- 10.2010 Poswietne, Poland - *“Financial instruments for promotion of biofuels“*
- 21.10. 2010 Lisabon, Portugal - *National/regional workshop*
- 11.2010, The Netherlands - *“Analysis of policy effectiveness“*
- 11.2010, Germany - *National/regional workshop*
- 16.11.2010 Vienna, Austria – *“Electric and biogas cars and filling stations”*

Thank you !