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**A Local Supporting-Programme
for the Promotion of
Adequate Alternative Engines and Fuels
in the City of Cologne**



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A Local Supporting-Programme for the Promotion of Adequate Alternative Engines and Fuels in the City of Cologne



1. Introduction

2. Supporting programme

3. Transferability

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INTRODUCTION- the Co-ordination office

- founded 1998
- in the course of 1992 UN earth summit
- key words: sustainability, citizen participation
- focus is on measures which can be implemented by each individual
- in this case: sustainable measures concerning individual mobility



INTRODUCTION- road traffic and sustainability

- 96% of road traffic depends on petrol/diesel
- well-known ecological and economical problems
- one possible solution is switching to adequate alternative engines/fuel
- current market share is tiny
- two reasons: low familiarity and higher investment costs

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SUPPORTING PROGRAMME - Purpose

- spread knowledge about alternative engines/fuels (communication campaign)
- provide investment costs with a free-of-interest loan
- loan is to be repaid by lower operational costs of alternative engines/fuels

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SUPPORTING PROGRAMME – Purpose

- Supporting programme planned to be part of municipal climate protection plan
- but green house gas emissions not only criteria
- adequacy of alternative engines/fuels assured by other criteria



SUPPORTING PROGRAMME – criteria

Criteria	Aspects of the criteria
<i>Applicability</i>	<ul style="list-style-type: none">• application by each individual citizen technically possible today?• Infrastructure available in Cologne ?
<i>Economic viability for the car owner</i>	<ul style="list-style-type: none">• higher investment costs?• lower operational costs?
<i>GHG-emissions</i>	<ul style="list-style-type: none">• lower GHG emissions concerning the whole production cycle?
<i>Emissions of local pollutants</i>	<ul style="list-style-type: none">• lower emissions of local pollutants?
<i>Sustainability</i>	<ul style="list-style-type: none">• conflict of objectives?• future perspective?

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SUPPORTING PROGRAMME – selection of alternatives

Fossil-based alternatives	Renewable alternatives	Other alternative fuels (fossil and/or renewable)	Alternative engines
Compressed Natural Gas (CNG)	Pure Vegetable Oil	Ethanol	Electric Cars
Liquefied Petroleum Gas (LPG, also Autogas)	Biodiesel	Methanol	Hybrid Cars
Coal-to-liquids (CtL)	Biogas	Dimethylether (DME)	Fuel Cell
Gas-to-liquids (GtL)	Biomass-to-liquids (BtL)	Hydrogen	
Water-in-Diesel Emulsions	Hydro Thermal Upgrading (HTU) Diesel		

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SUPPORTING PROGRAMME – selection of alternatives

Criteria of applicability

Fossil-based alternatives	Renewable alternatives	Other alternative fuels (fossil and/or renewable)	Alternative engines
Compressed Natural Gas (CNG)	Pure Vegetable Oil	Ethanol	Electric Cars
Liquefied Petroleum Gas (LPG, also Autogas)	Biodiesel	Methanol	Hybrid Cars
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SUPPORTING PROGRAMME – selection of alternatives

Criteria of economic viability

Fossil-based alternatives	Renewable alternatives	Other alternative fuels (fossil and/or renewable)	Alternative engines
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SUPPORTING PROGRAMME – selection of alternatives

Criteria of green house gas emissions

Fossil-based alternatives	Renewable alternatives	Other alternative fuels (fossil and/or renewable)	Alternative engines
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Coal-to-liquids (CtL)	Biogas	Dimethylether (DME)	Fuel Cell
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SUPPORTING PROGRAMME – selection of alternatives

Criteria of local pollutants

Fossil-based alternatives	Renewable alternatives	Other alternative fuels (fossil and/or renewable)	Alternative engines
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Coal-to-liquids (CtL)	Biogas	Dimethylether (DME)	Fuel Cell
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SUPPORTING PROGRAMME – selection of alternatives

Criteria of sustainability

Fossil-based alternatives	Renewable alternatives	Other alternative fuels (fossil and/or renewable)	Alternative engines
Compressed Natural Gas (CNG)	Pure Vegetable Oil	Ethanol	Electric Cars
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SUPPORTING PROGRAMME – free-of-interest loan

- give incentives for citizens to use an alternative
- should not lead to higher operational costs
- in each case, individual calculation based on:
 - mileage
 - fuel consumption
 - investment costs

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SUPPORTING PROGRAMME – calculation example

<i>Car</i>	<i>Operating costs (Ct./km)</i>	<i>Reduction of operating costs (Ct./km)</i>	<i>Investment costs (€)</i>	<i>Amortisation (in years) for mileage of 20,000km</i>
Volkswagen Golf 1.6	37.41	-	-	-
Volkswagen Golf 1.6, retrofitted to CNG	32.11	5.30	2,500	2.35
Volkswagen Golf 1.6, retrofitted to LPG	32.68	4.73	2,250	2.36

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SUPPORTING PROGRAMME – conclusions from example

- in general: the higher the mileage and the fuel consumption the lower the amortisation period
- electric and hybrid cars have higher investment costs and higher amortisation periods
- their inclusion depends on the overall amount of money available for free-of-interest loan and the duration of the supporting programme

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SUPPORTING PROGRAMME – effects

- current planning: until 2020 (1. phase) with 1,000,000 € annually available for external projects proposal
- Assuming 5% were available for free-of-interest loan . . .
- . . . enables using CNG or LPG around 20 times annually
- hybrid only 3 times and electric cars only 1-2 times

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SUPPORTING PROGRAMME – effects

- 20 times switching to CNG or LPG . . .
- . . . means a GHG reduction of 15 tonnes CO₂eq for an annual mileage of 15,000km
- the car owner saves 600€ annually after amortisation period is finished
- No costs for the loan provider, apart from labour costs and opportunity costs

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SUPPORTING PROGRAMME – communication campaign

- spread knowledge about all alternative engines and fuels, not only selected ones
- promote free-of-interest loan programme
- provide information about ways to sustainable transport sector (public transport, car sharing , ..)
- internet site, booklets, leaflets, car exhibitions, presentations,...

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TRANSFERABILITY

- idea could be adopted by other cities according to their specific situation
- also possible adoption to other measure in energy sector
- preconditions: higher investment costs, lower operating costs, sustainability
- example: motion detector for lights

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Thank you very much for your attention

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