

Renewable Energy and Transport Developments

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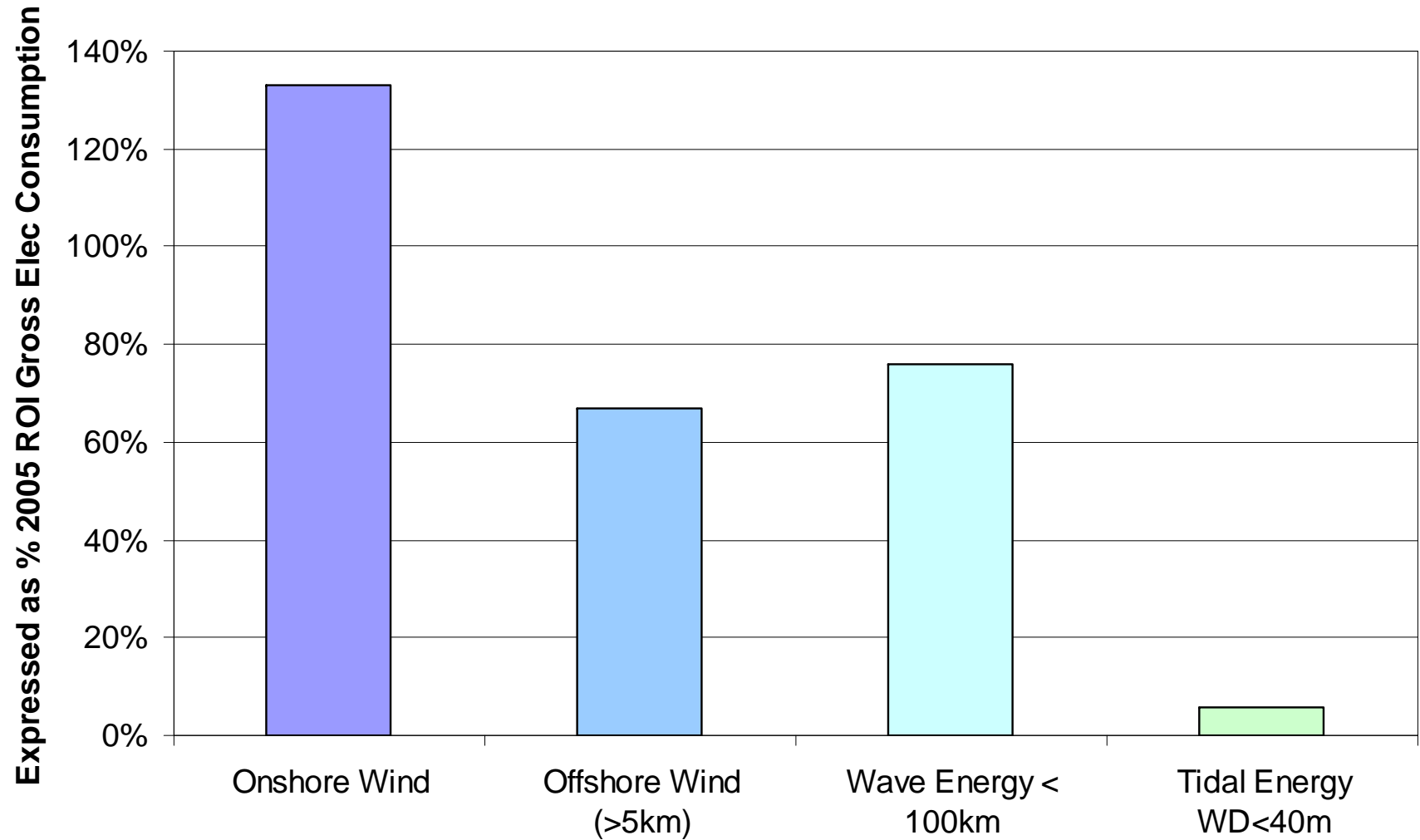
Radisson, Dublin, Feb 2009

Overview



- Renewable Energy and Transport Developments
- Electric Vehicles Discussion
- Support Mechanisms

Accessible Intermittent Renewable Energy Resource ROI (% of 2005 ROI Gross Electricity Consumption (28TWh))



1) SEI "Renew able Energy Resources in Ireland for 2010 and 2020 - A Methodology", Nov 2004; 2) DETI, DPE, Interreg II "Assessment of Offshore Wind Energy Resource", Nov 2000; 3) SEI "Accessible Wave Energy Resource Atlas Ireland 2005", Dec 2005; 4) SEI "Tidal & Current Energy Resource in Ireland", Nov 2005

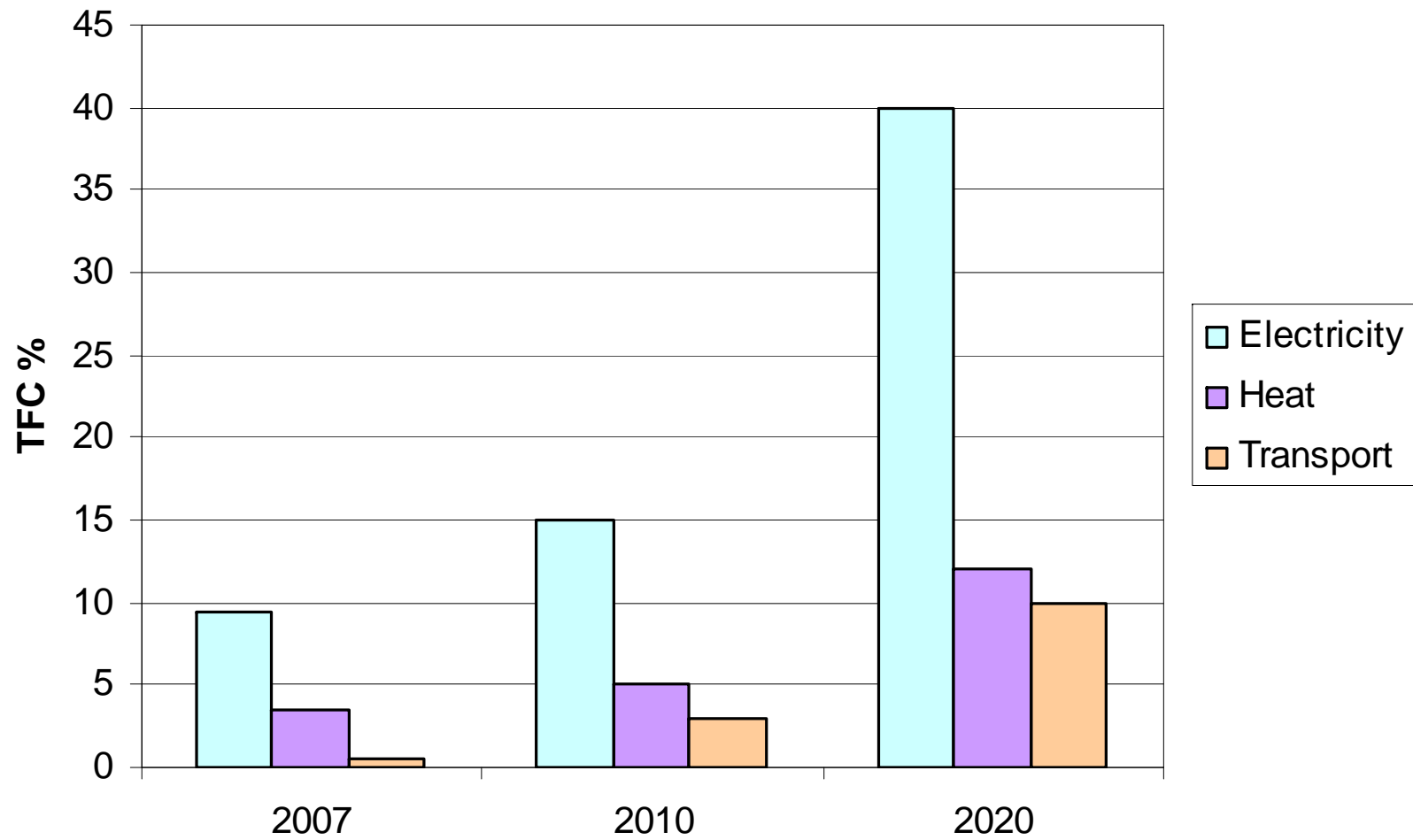
Wind Development in Ireland

- Wind Connected by Dec 08 = 1,000MW
- Contracted Farms = 1,412MW
- Gate 3 = 3,900MW
- 5,500MW wind generation required by 2020
- Peak Power Demand 6,700MW 2020



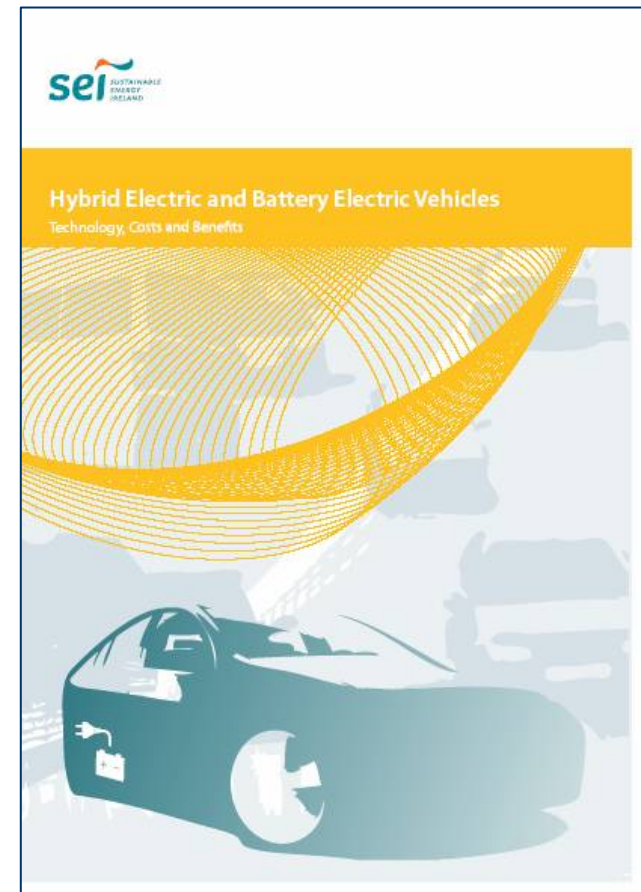
(Source: Eirgrid, CER)

Ireland's Renewable Energy Targets (% Total Final Consumption)



RE Transport Developments in Ireland

- National Target to achieve 10% electric vehicle (~250k cars) use by 2020
- Interdepart Working Group established
- Biofuels Target proposed revision to 3% by 2010
- RE Supply Directive defines 2020 Target of 16% by TFC for all RE
- SEI BEV Study Completed:
 - Review of technologies, emissions, measures
 - http://www.sei.ie/Publications/Renewables_Publications/

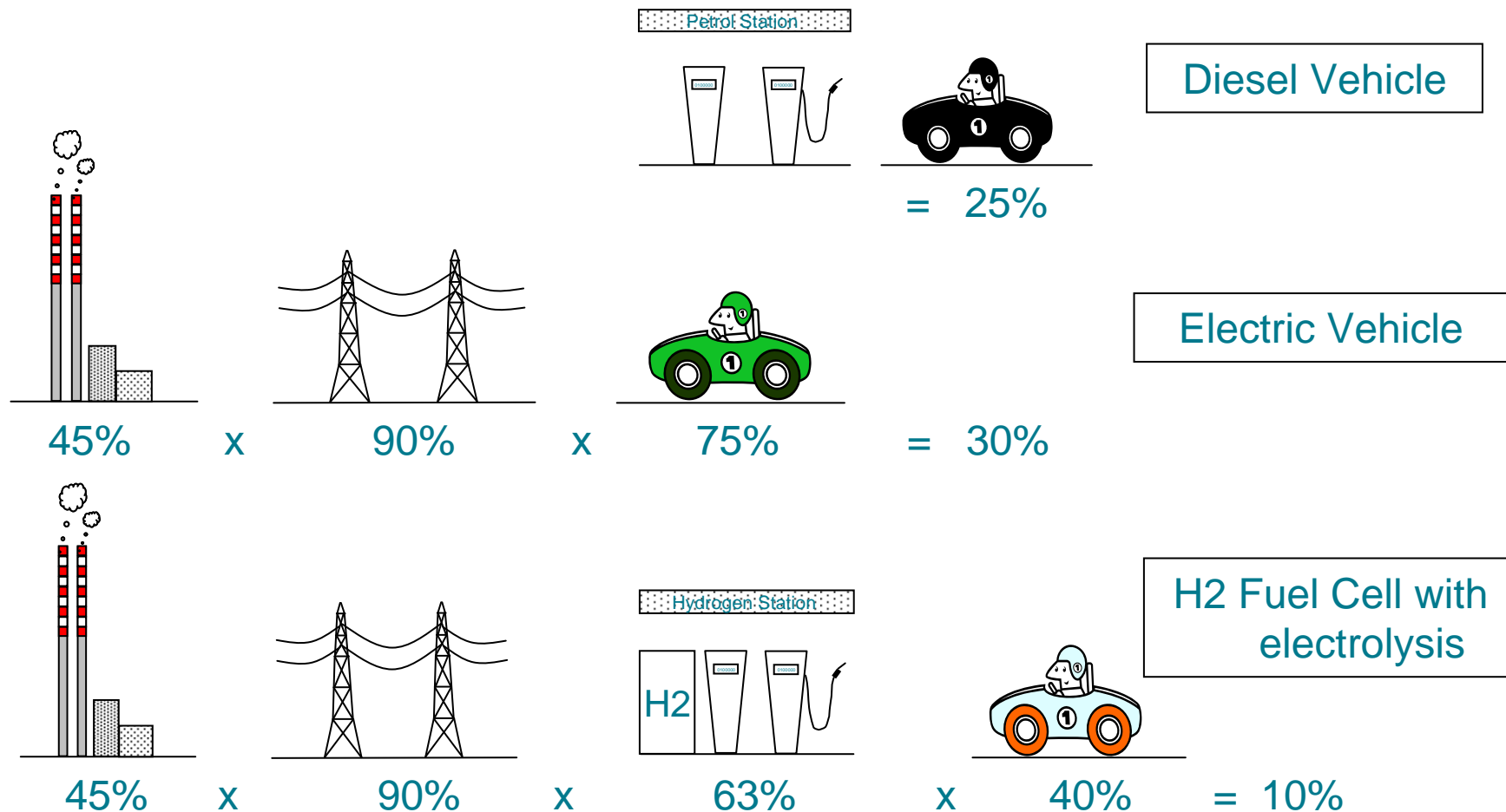


History of Electric Vehicles

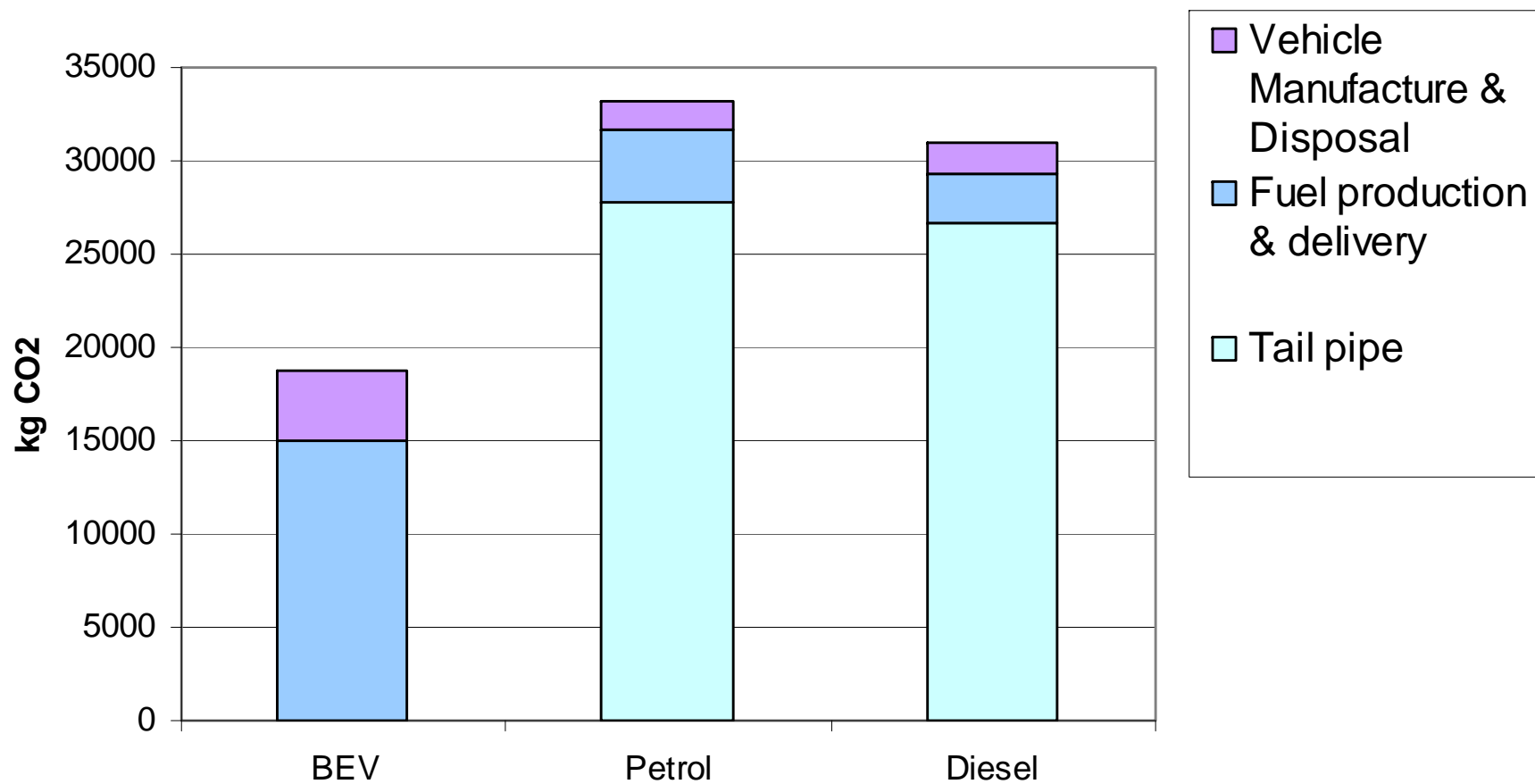
- Robert Anderson built first electric vehicle ~ 1835
- Higher capacity batteries available in 1881
- First commercial applications in 1897 – New York taxi firm
- Range of 18miles / 14mph, no gears, noise or emissions
- Production peaked in US ~ 1912
- Intercity roads improved, oil discovered in Texas, fuel prices dropped
- Henry Ford's mass production greatly reduced cost of ownership for Internal Comb Vehicles



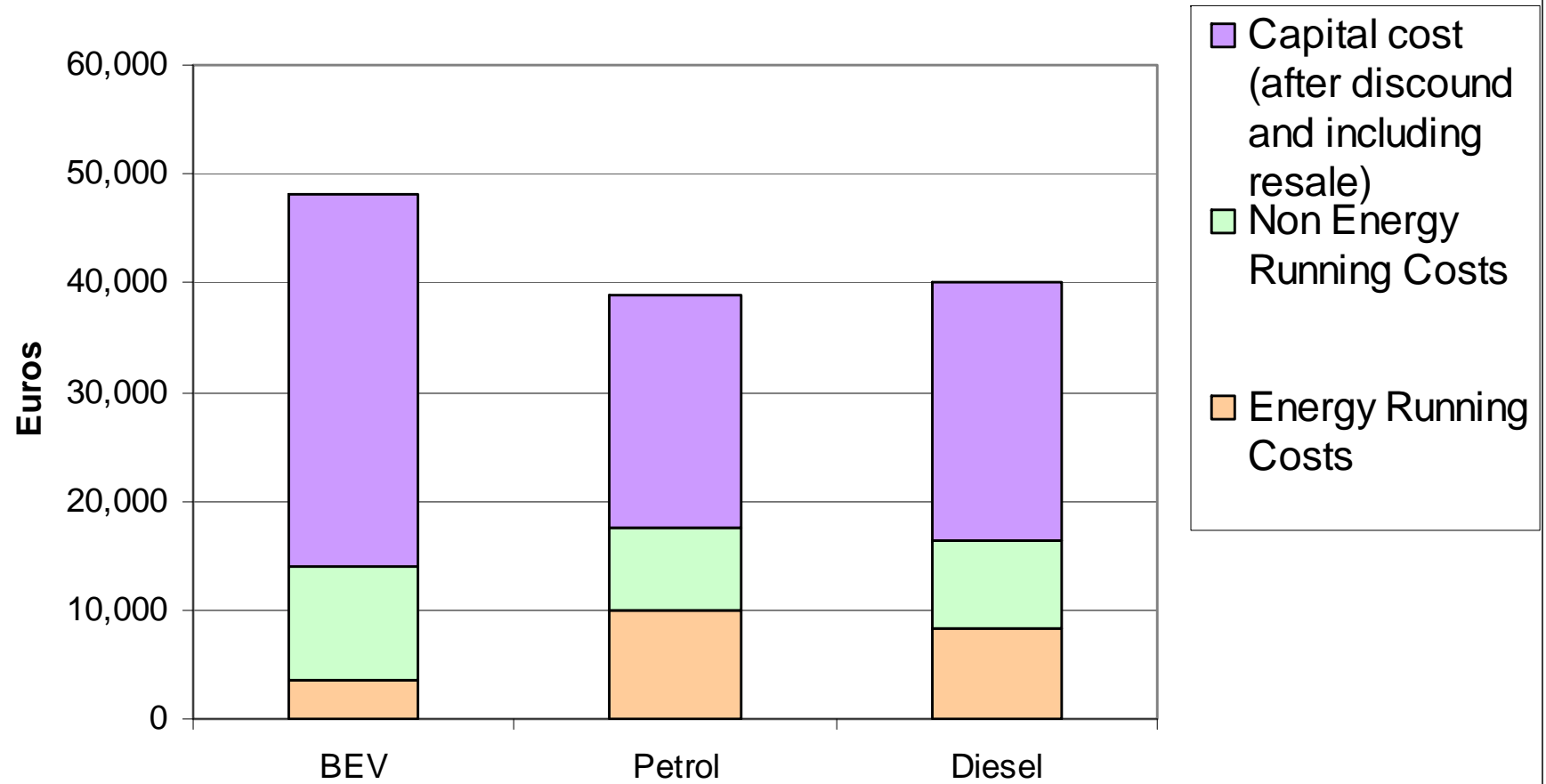
Fuel Cycle Efficiency Illustration



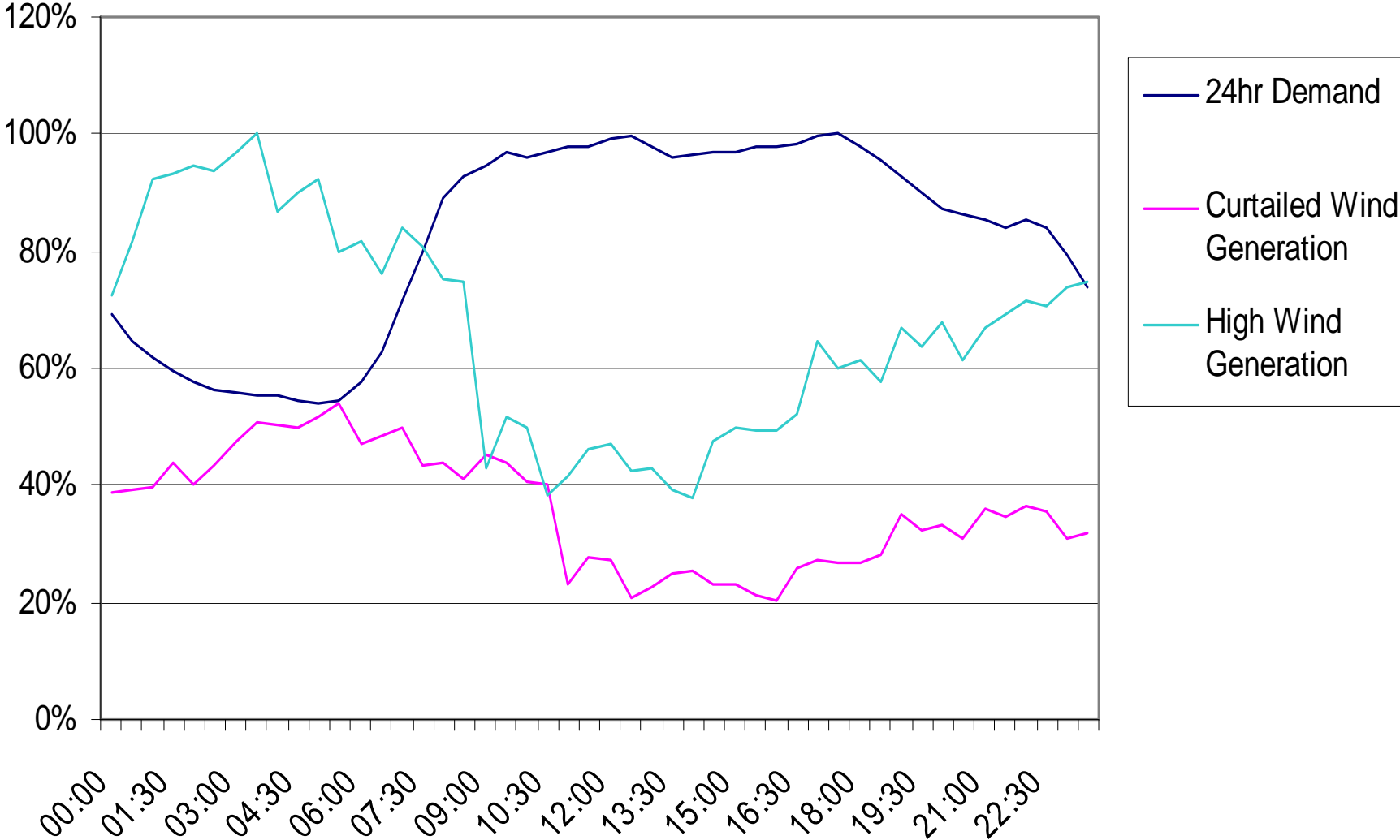
Battery Electric Vehicle Lifecycle CO2 Emission Comparison with equivalent Petrol and Diesel Vehicles (10 yr ownership, 10,500 miles pa)



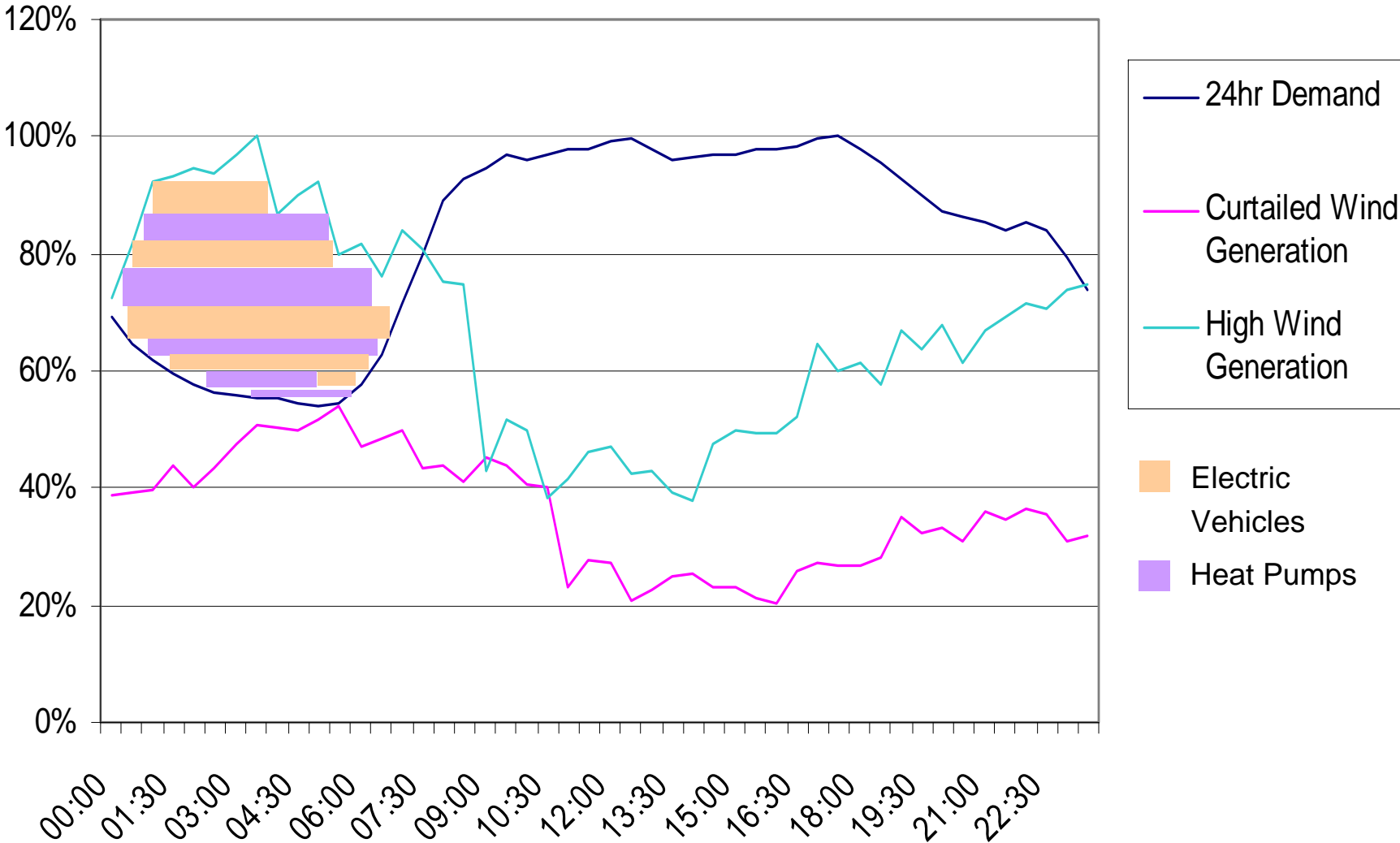
Battery Electric Vehicle Lifecycle Costs compared with equivalent Petrol and Diesel Vehicles (10 yr ownership, 10,500 miles pa)



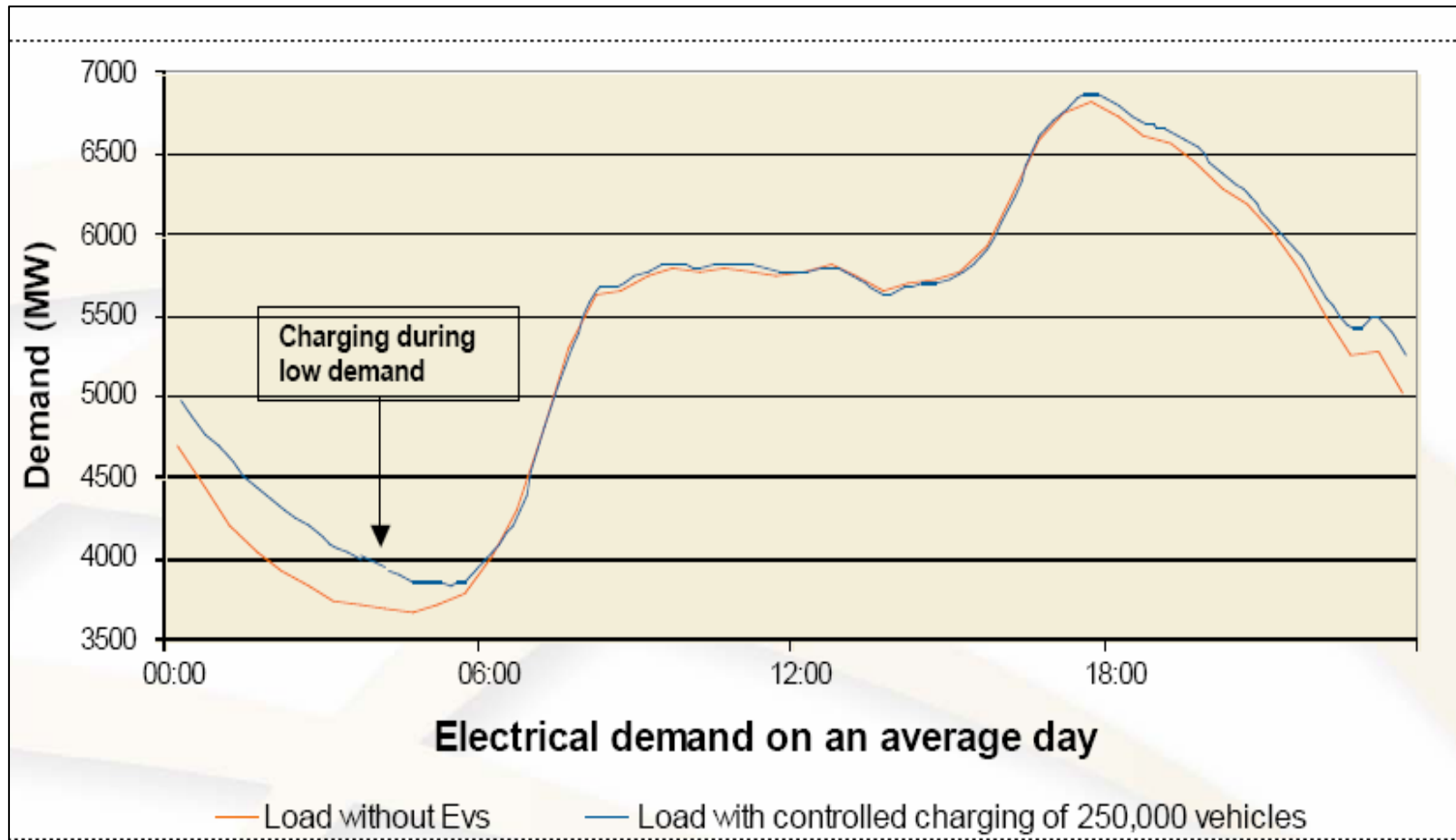
Wind Management Scenario



Wind Management Scenario

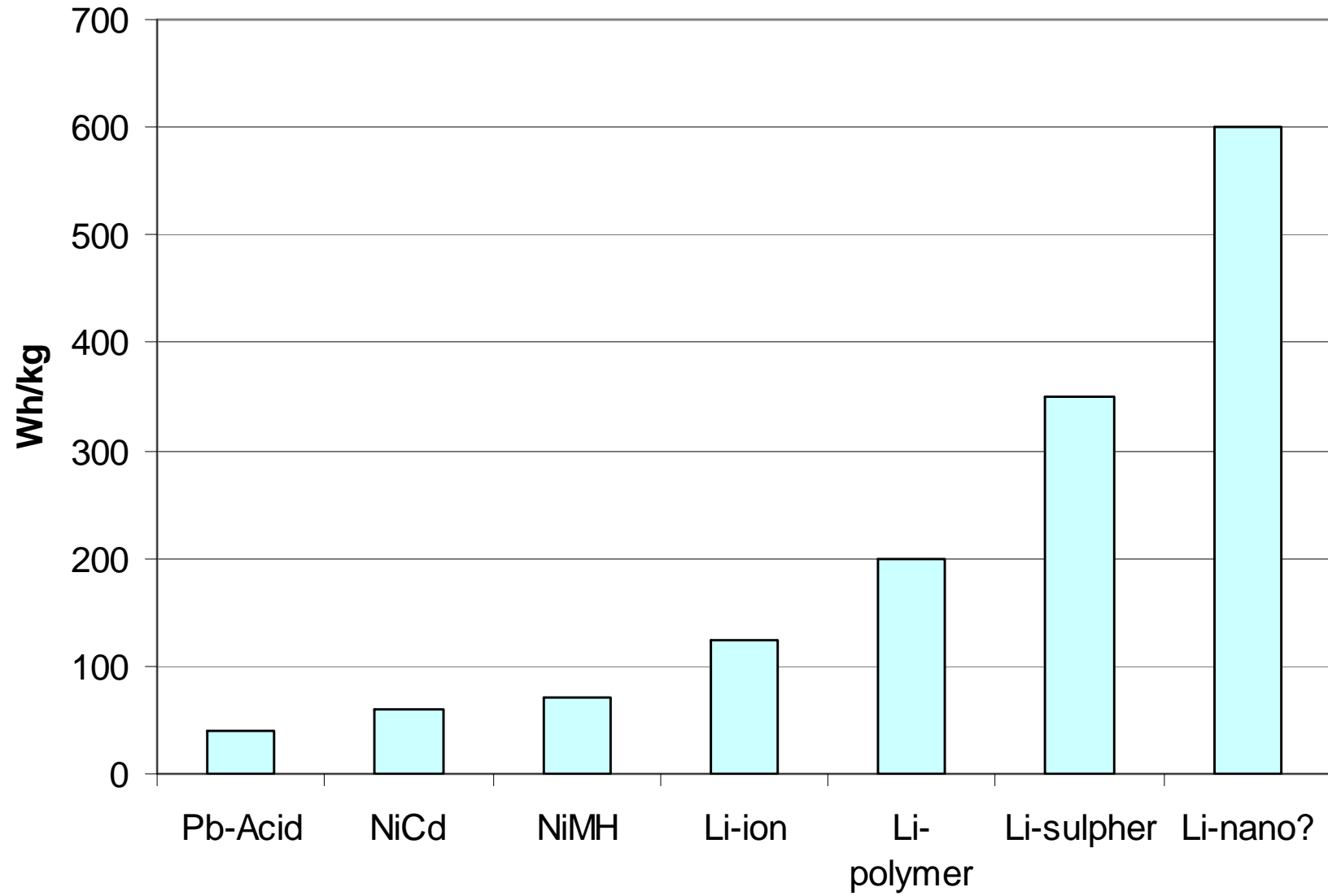


Impact of 10% Passenger Vehicles on Demand Profile



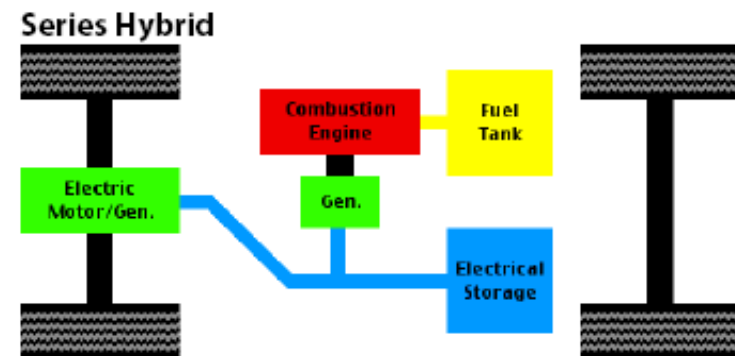
Source: Eirgrid

Specific Energy Density of Batteries



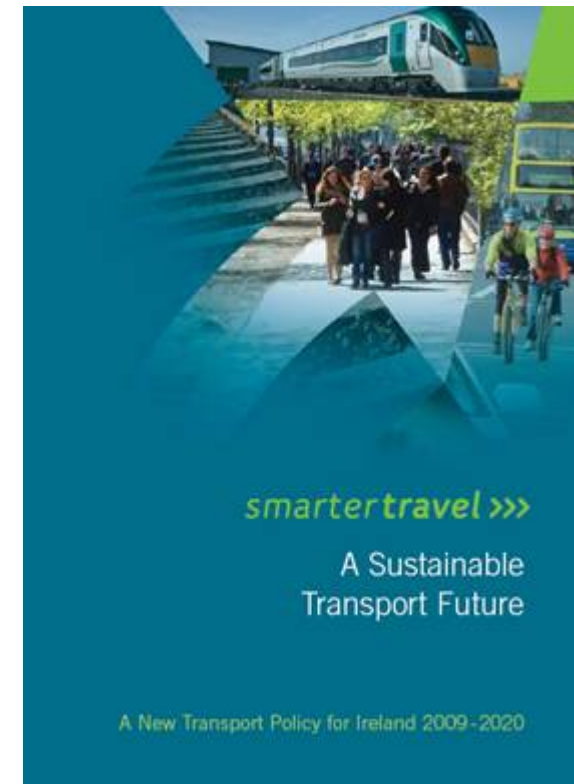
Dublin Bus – Hybrid Bus Demonstration

- Wrightbus - Ballymena
- Series hybrid drive system – no gearbox
- 2.4L diesel (Ford Transit) + Li Battery + Elect Motor
- 110kW Diesel + 2 x 85kW Electric motors
- Engine size reduced from 7 Litre
- Fuel consumption reduced by up to 30%
- Substantial reductions in CO₂, Particulates and noise expected
- Regenerative breaks, aluminium frame
- Ownership costs higher



Smarter Travel Plan – 2009 to 2020

- 500,000 car based commuters using alternative modes of transport by 2020
- Alternatives such as walking, cycling, public transport will comprise 55% of all work journeys
- Car sharing & e-working encouraged
- Local authorities to prepare transport plans
- 4.5billion Euro cost
- 10% Electric Vehicles target by 2020 (~250k cars)
- {Dublin Transport Office public consultation 2030 Vision for Greater Dublin (22nd March)}



Non-Fiscal Measures

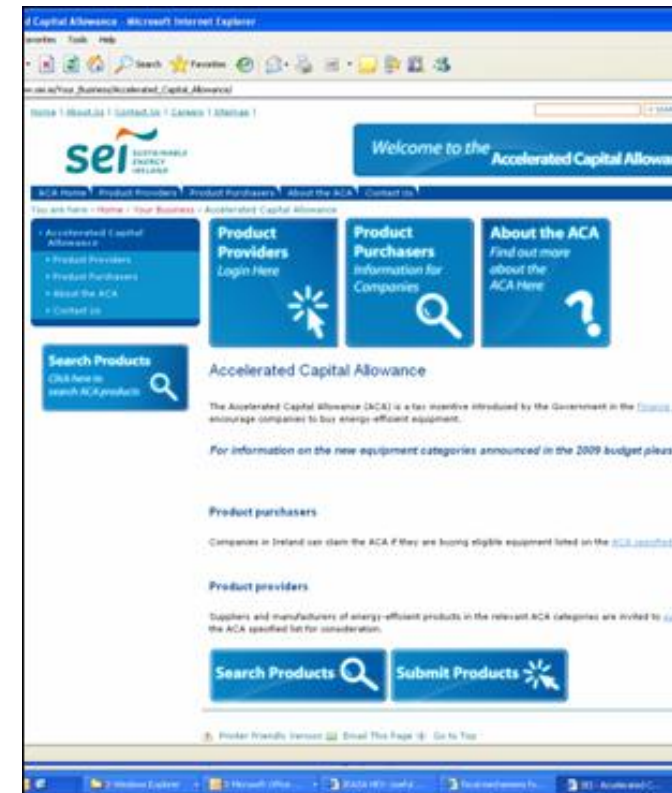


- Mandate Instruments
 - Non-CO2 emission standards in place (1993)
 - Draft EU proposal to limit CO2 to 120g/km
 - Vehicle Labelling introduced 1st July 08
- Green Procurement Strategies
 - EU public procurement directive (mid 2010)
- Planning Activities
 - Charge points, parking priority, urban access
- R&D market, demonstration and reporting
- Education and promotional activities
 - Electric Vehicle Car Buyers Guide
 - SEI “How Clean is Your Car” Calculator:
 - http://www.sei.ie/your_home/how_clean_is_your_car/

Vehicle Information	
CO2 emission figure (g/km) 	
Fuel Use (estimated) for 18,000 Kilometres <small>A fuel use figure is indicated to the consumer as a guide for comparison purposes. This figure is calculated by using the combined drive cycle (urban and extra urban fuel consumption cycles)</small>	900 litres
Motor Tax for 12 Months <small>Motor Tax varies according to the CO2 emissions of the vehicle.</small>	€ 160
Vehicle Registration Tax (VRT) Rate <small>Percentage rate of VRT payable of the value of the vehicle is dependant on the CO2 emissions.</small>	18 %
Environmental Information <small>A guide on fuel economy and CO2 emissions which contains data for all new passenger car models is available at any point of sale free of charge or directly from the Society of the Irish Motor Industry, 5 Upper Pembroke Street, Dublin 2, Tel: 01-6761660, web address: www.simi.ie. In addition to the fuel efficiency of a car, driving behaviour as well as other non-technical factors play a role in determining a car's fuel consumption and CO2 emissions. CO2 is the main greenhouse gas responsible for global warming.</small>	
Make: HONDA	
Model/Version: Civic 06 1.4 I-DSI SE	
<small>Carbon dioxide emissions (g/km): 139 g/km This figure may be obtained from the vehicles Certificate of Conformity. Important note: Some specifications of this make/model may have lower CO2 emissions than this. Check your dealer</small>	
Fuel Consumption	
Drive Cycle	Litres/100km
Urban	6.9
Extra-urban	7.6
Combined	8
Fuel Type:	Petrol
Engine Capacity (cc):	1330
Transmission:	I-SHIFT

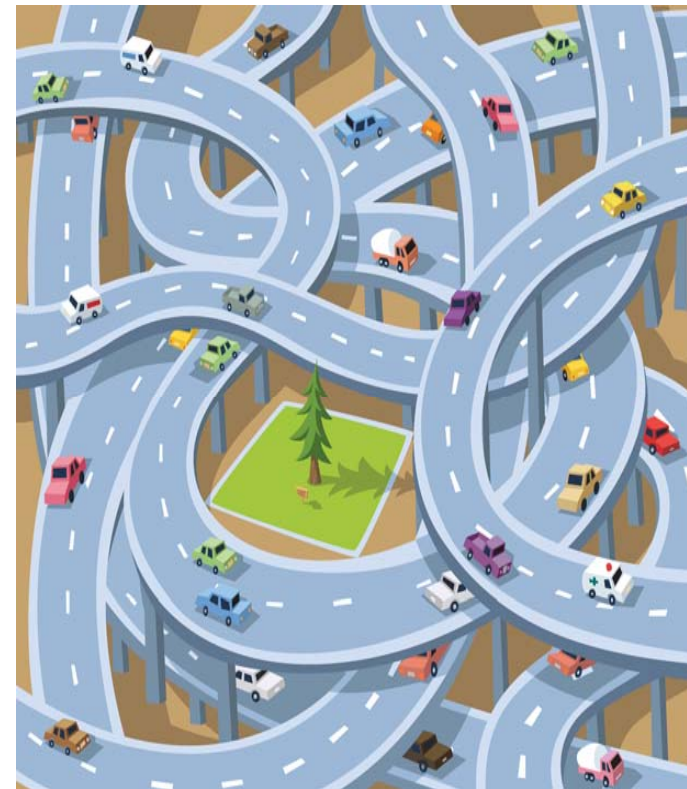
Fiscal Support Options

- Vehicle Registration Tax
 - Electric vehicles currently exempt
 - Deferred VRT recovered from conventional cars
- Accelerated Capital Allowances Scheme
 - 100% tax write off in yr 1
 - Consultation (www.sei.ie/aca)
- Carbon Tax on petrol and diesel 2010?
- Relief from future congestion charges?
- Reduced Parking Fees and Toll Charge



SEI Support for Alternative Transport Research Activities

- 1m Euro Budget to support development of EV and Alternative Transport
- Likely support areas to include:
 - Fleet Conversion Feasibility Studies
 - Demonstration activities – infrastructure/vehicle technologies
 - Modelling activities
 - R&D Support – Battery Retrofit
 - Public dissemination activities



Conclusions

- New RE Directive enables Ireland to achieve its RE targets more effectively by using its significant wind power resource to contribute to transport and heat areas
- EVs will enable displacement of imported fossil fuels for transport by wind energy
- EV technology looks more likely than Hydrogen to become a leading low emission transport technology in the near to medium
- EVs have the potential to contribute to significant CO₂ reductions
- Technology development, infrastructure development, consumer acceptance with appropriate measures will facilitate a more rapid uptake of EV technology

Go raibh maith agat



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