



NL Agency
Ministry of Economic Affairs, Agriculture and
Innovation

MOBILITY: TECHNOLOGY PRIORITIES AND STRATEGIC URBAN PLANNING

Summary - discussion

[http://www.iea.org/aboutus/
standinggroupsandcommittees/
egrd/](http://www.iea.org/aboutus/standinggroupsandcommittees/egrd/)

or google: IEA-egrd

>> *Focus on energy
and climate change*





Day 1

- *What is the current status of vehicle efficiencies, and what more can realistically be achieved before 2020?*
- *What are the actions needed to achieve further efficiency gains and who is responsible (e.g. automobile manufacturers, policy makers)?*
- *Comparing new transport options, which have the greatest potential and the least number of barriers to implementation (e.g. financial, policy, R&D or other)?*
- *What are electricity network issues urban planners and policy makers need to address to implement light rail or hybrid and electric vehicle programmes?*

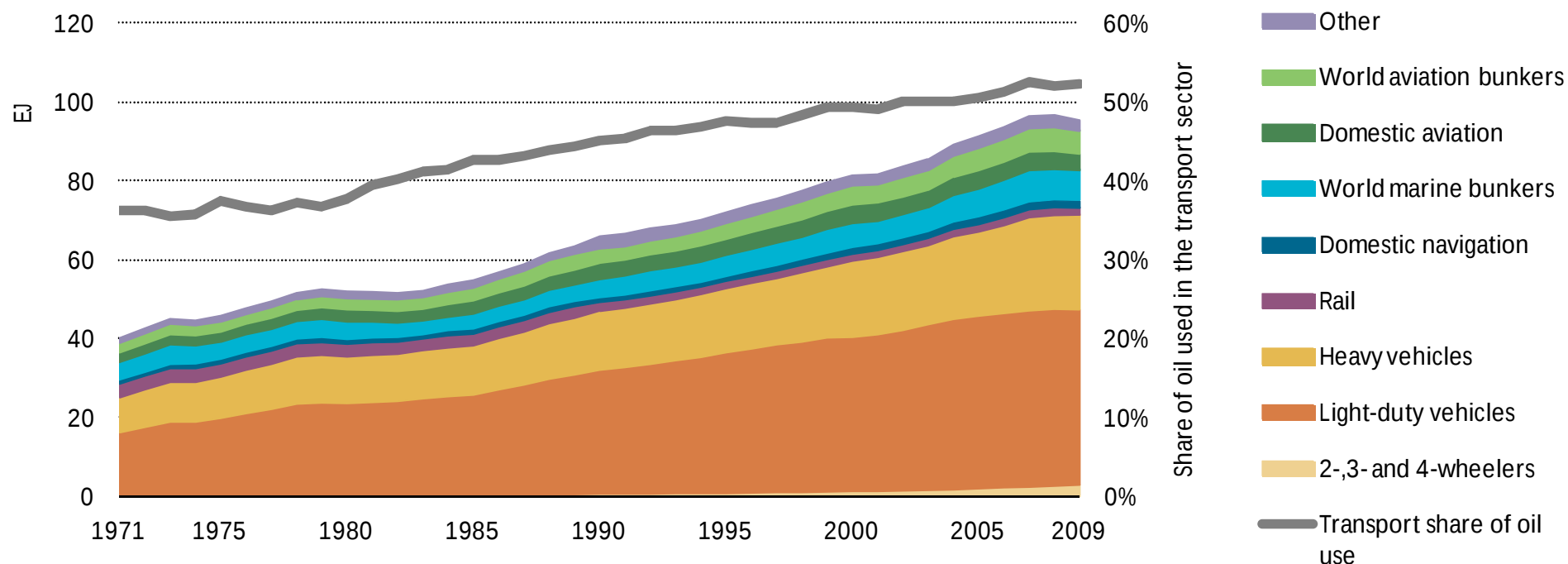


Day 2

- *Which policies or frameworks have proven to be effective in reducing transport demand?*
- *Urban transport infrastructure has grown organically since the first automobiles. How can we integrate the newer fuels and technologies into urban landscapes?*
- *Are there country- or region-specific advantages to adopting particular transport technologies?*
- *Which financing mechanisms have proven to be successful for new transport programmes?*

Historic trends

World transport energy use has doubled in past 30 years



Light-duty vehicles continue to drive growth, while road freight and air travel also increased rapidly in last decade.

Coverage of transport modes

2-3 wheelers

Light duty vehicles

- internal combustion
- hybrids / plug-in hybrids
- fuel cell vehicles
- electric vehicles

Heavy duty vehicles

- passenger (minibuses, buses, BRT and intercity buses)
- freight (medium and heavy trucks)

Rail

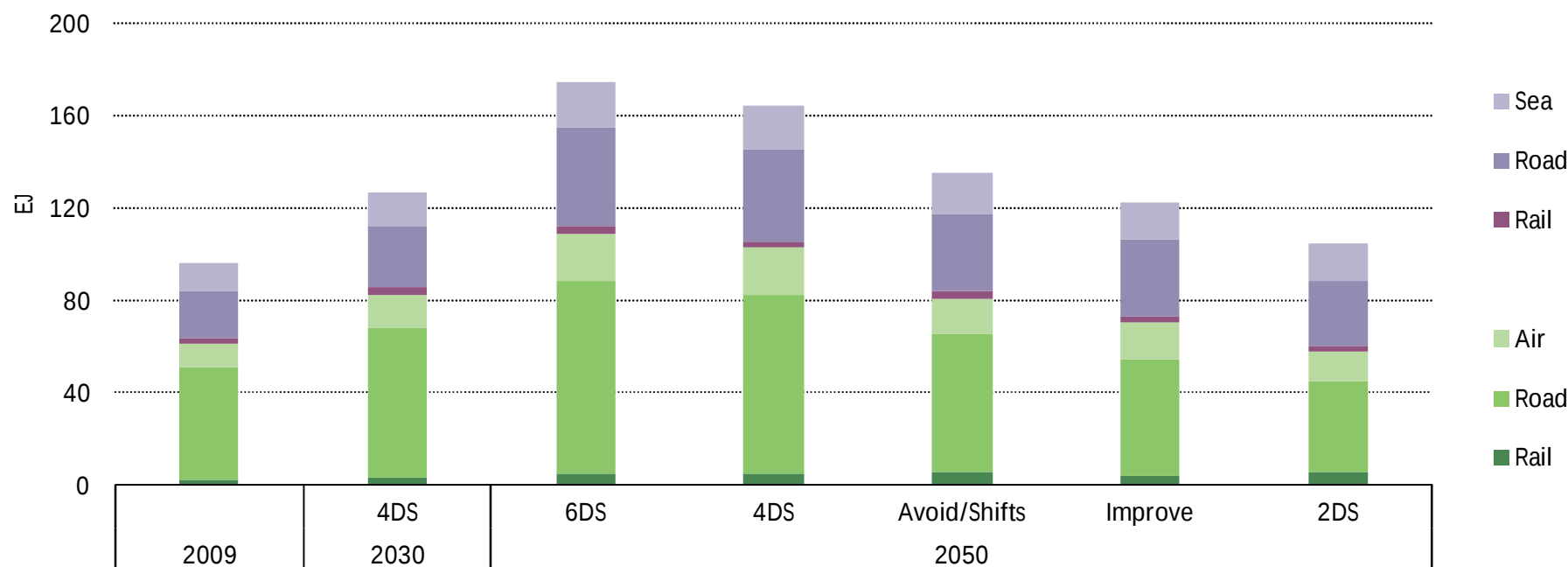
- passenger and freight
- HSR (added in 2012)

Air / Water transport



ETP 2012 transport outlook to 2050

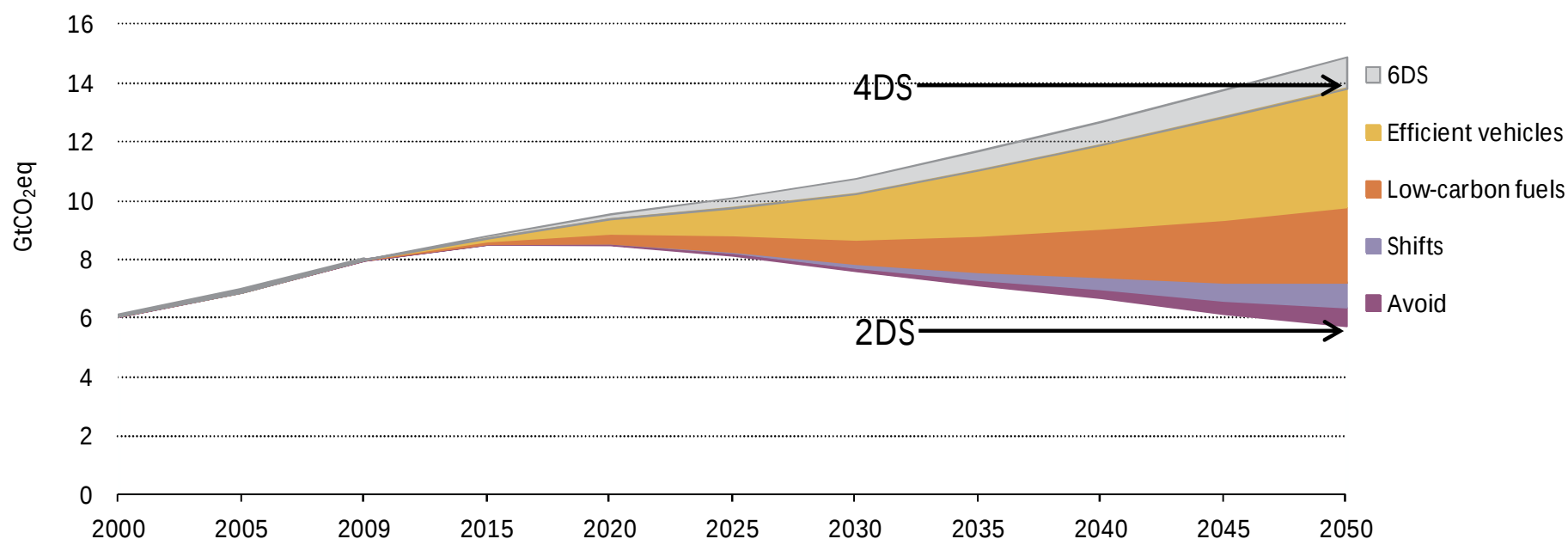
Transport energy use by mode in the ETP scenarios



Energy use could increase as much as 70% by 2050 if no further policies are adopted in support of efficiency, alternative vehicles/fuels and modal shifting.

ETP 2012 transport outlook to 2050

Efficient vehicles and alternative fuels key to achieve 2DS



An 'avoid, shift and improve' approach is the most cost effective to reach 2DS objectives



There are ambitions

Because:

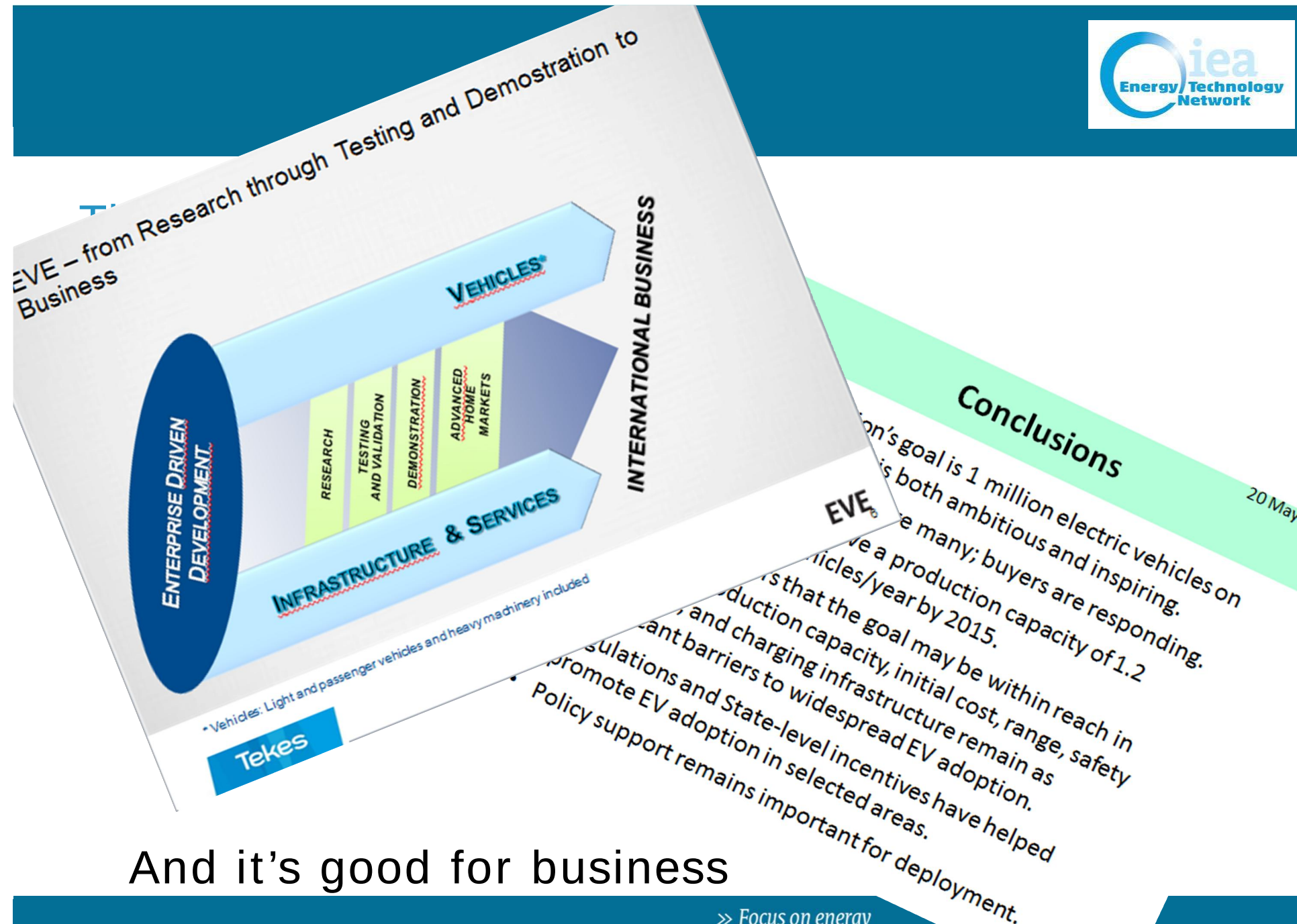
- There is too much air pollution
- We want to avoid congestion
- It's getting to expensive
- Safety...
- Etc.....



Conclusions

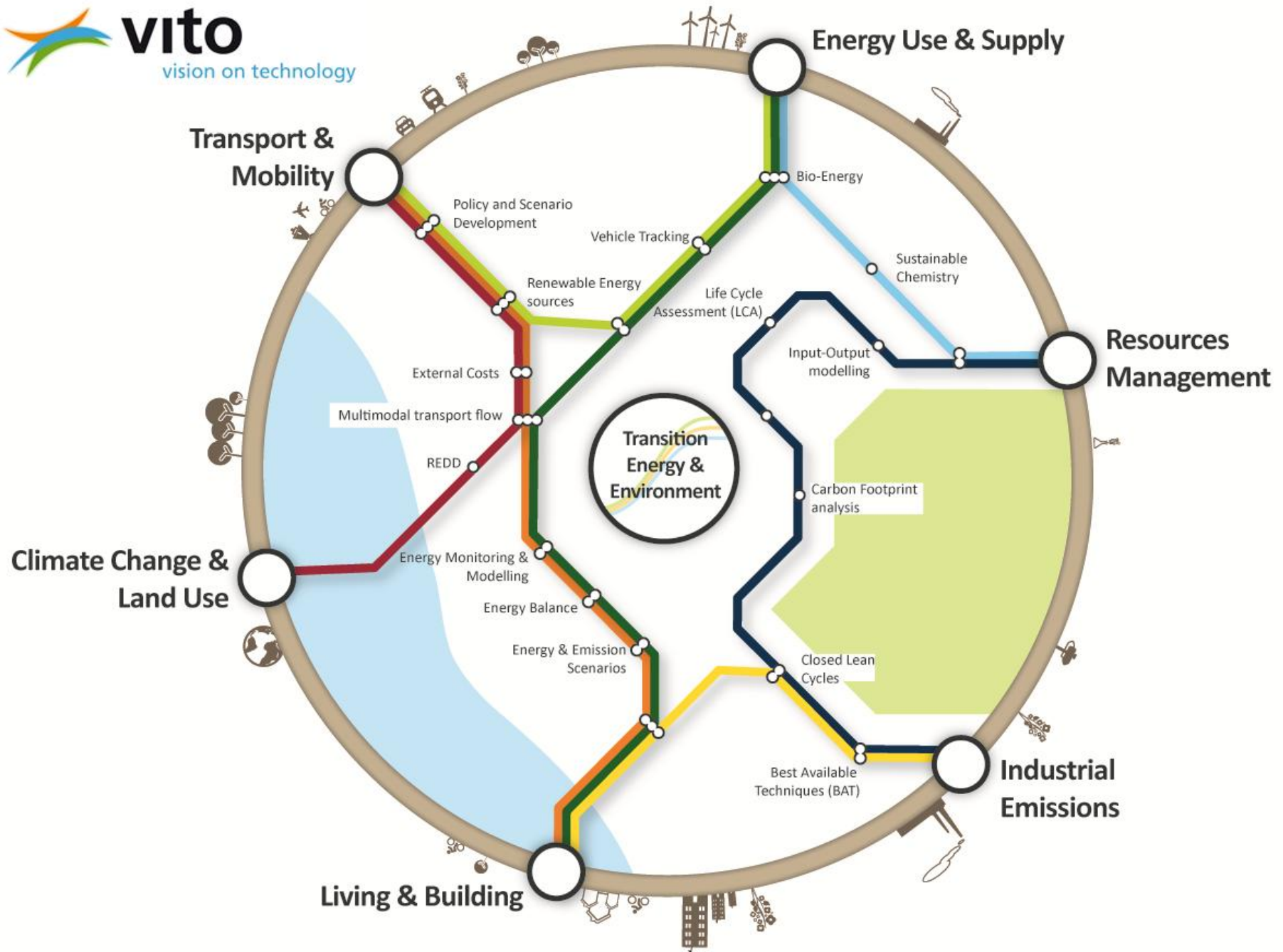
20 May

- U.S. Administration's goal is 1 million electric vehicles on the road by 2015. It is both ambitious and inspiring.
- The attractions of EVs are many; buyers are responding.
- The U.S. hopes to have a production capacity of 1.2 million electric vehicles/year by 2015.
- While it appears that the goal may be within reach in terms of production capacity, initial cost, range, safety concerns, and charging infrastructure remain as significant barriers to widespread EV adoption.
- Regulations and State-level incentives have helped promote EV adoption in selected areas.
- Policy support remains important for deployment.



And it's good for business

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Elements determining the environmental impacts of traffic

Community structure



Traffic volumes & choice of transport mode



Energy for transport



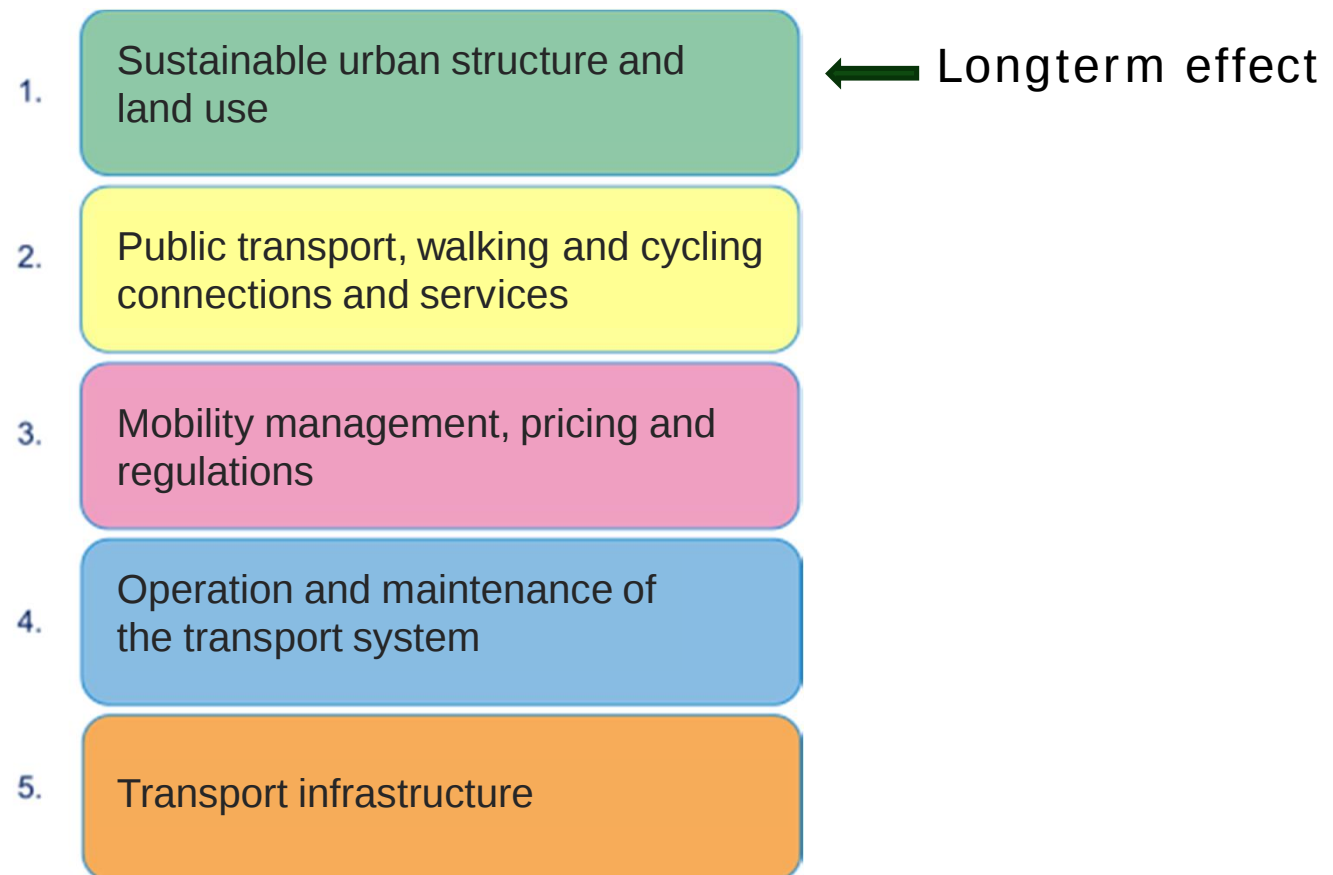
Vehicles and user behaviour



Policy orientation

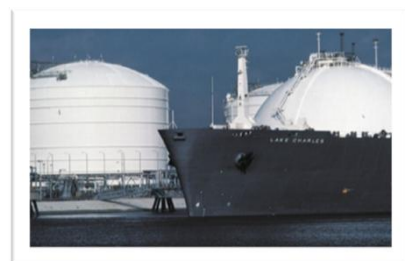
Technology orientation

The transport system is developed by implementing a diverse range of measures set out at different development levels through cooperation between the parties.



Alternative fuels – Well to Wheel

Well to tank



Tank to wheel





Technological Achievements *(that have to be improved)*

Fuel cell:

- › Power density
- › Reliability
- › Lifetime
- › Low-temperature performance
- › Environmental adaptation

Battery:

- › Nickel-metal battery
- › Lithium ion battery
- › Super capacitor battery

Battery Models for Busses

For electric busses, several options are available to ensure maximum operational time.



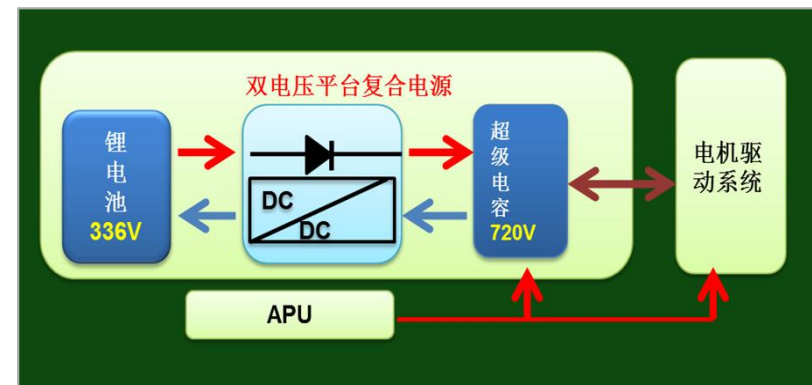
Battery



Recharging



Quick-Recharging

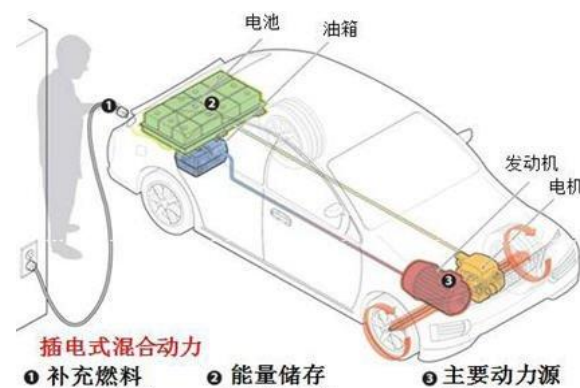


Extended Range

Technological Achievements

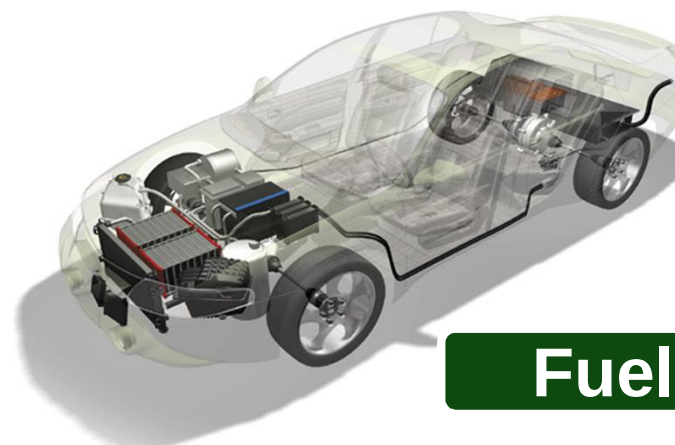


Hybrid



Plug-in Hybrid

Electric Powered



Fuel cell

More small cars needed?

smorsche



smerrari



smorvette



smamborgin



“Unlimited” new options

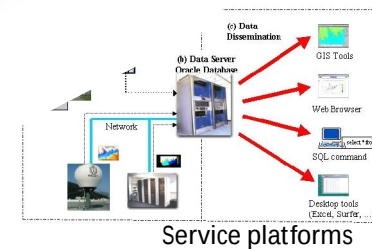
VTT TECHNICAL RESEARCH CENTRE OF FINLAND

Role of ICT in transportation services

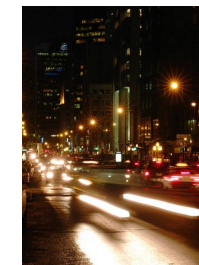
- ICT is a key enabler of energy efficient smart transport services:
 - Fast, mobile internet connections
 - Smartphone as the universal terminal
 - Common platforms enabling combining different services
- The major challenge is interoperability of systems
- Services supporting efficient mobility
- Flexible public transport (changing modes, real-time route information) & multi-modality
- Services for smart vehicles (e.g. driver support, safety, fuel optimization)
- Intelligent transport management (e.g. CO₂ optimisation)



Smart traffic



Users



Infrastructure

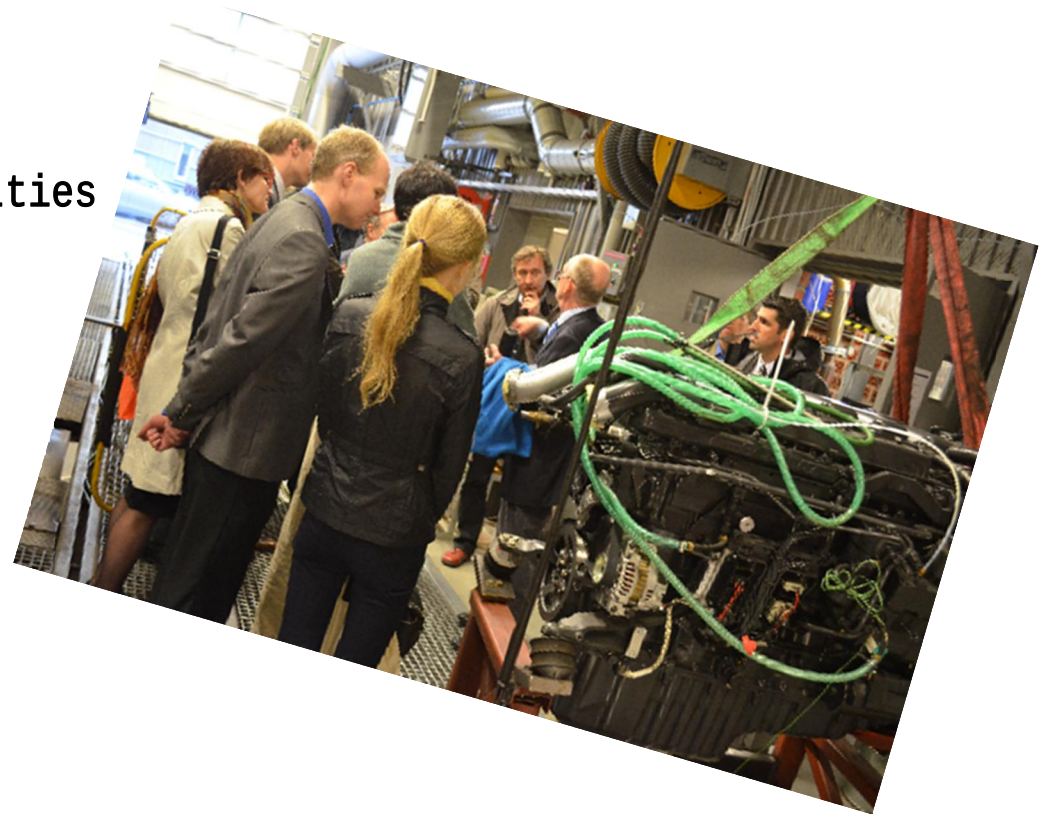
Smart vehicles





There are a lot of demonstration projects: Development Strategy of Industrialization of electric vehicle

- Pilot demonstration
- 8.8 billion RMB investment
- 27,432 electric vehicles in 25 cities
 - 9,834 electric cars,
 - 2,513 electric buses,
 - 3,305 hybrid electric cars,
 - 10,495 hybrid electric buses,
 - 52 fuel cell vehicles
 - 174 charging stations
 - 8,107 charging piles.





Are there country- or region-specific advantages to adopting particular transport technologies?

WintEVE – EV's in Winter Conditions

Need

- Testing and demonstration solutions for arctic conditions

Solution

- Testing ecosystem based on collaboration between Arctic Research Center and testing service providers in Lapland

Benefits

- Combination of world class testing environment and experience
- Technology tested in arctic conditions works elsewhere

Users

- EV manufacturers, OEM's
- Suppliers of charging technology and end user services, utilities etc.



www.centria.fi
www.winteve.fi



Tekes

DM 04-2011

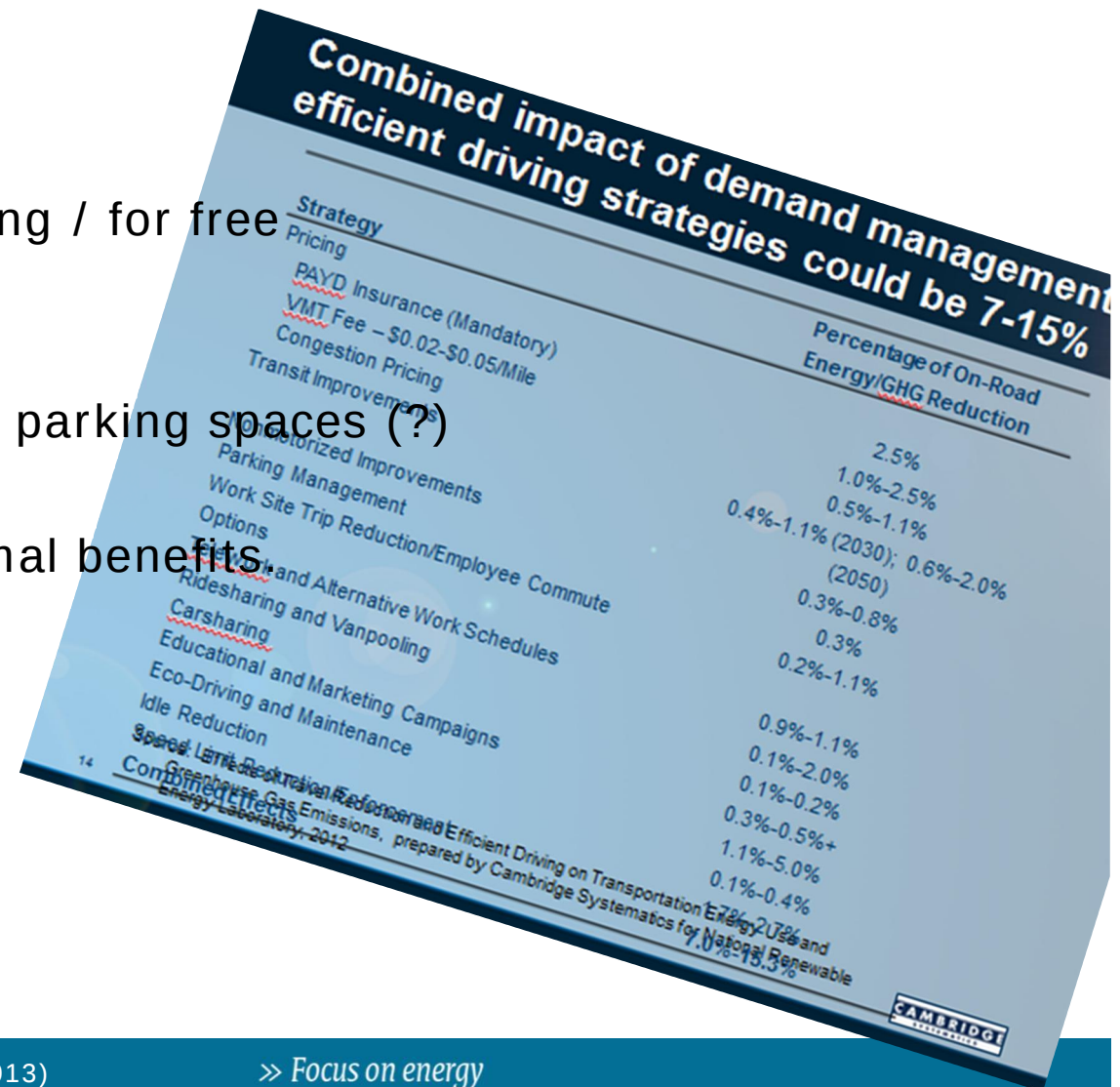
EVE



Financial incentives

- Congestion tax
- Reduced cost for e-charging / for free
- Tax reductions
- Purchase subsidy
- Free parking / designated parking spaces (?)

Not clear what has the optimal benefits.





Financial Models

- “google”- “apple” approach
- ----

Electric Vehicles 20 Ma

	40 kWh	60 kWh	85 kWh	85 kWh PERFORMANCE
Estimated Range (at 65 mph)	160 miles	220 miles	300 miles	300 miles
EPA 5-Cycle (center range)	160	220	285	285
0 to 60 mph	8.5 seconds	5.9 seconds	5.6 seconds	4.4 seconds
Top Speed	110 mph	125 mph	125 mph	130 mph
Peak Motor Power	225 hp	302 hp	362 hp	416 hp
Peak Motor Torque	310 lb-ft	317 lb-ft	325 lb-ft	443 lb-ft
Battery Warranty	8 year 100,000 miles	8 year 125,000 miles	8 year unlimited miles	8 year unlimited miles

- Tesla Model S: Plug-in Electric Vehicle
- Motor Trend Car of The Year 2013
- Consumer Reports Highest-Ever Rated Vehicle (99/100 score)



Logistic solutions

- Logistic solution (Stockholm)
- Start with municipal fleet to go sustainable
- Taxi priority





Model shift

- Don't tell you customer what to do
- Inform the public (good websites, best apps).

Emissions



I can reduce my emissions this much:

Kehraajantie 18, Espoo - Jätkäsaarenlaituri 3, Helsinki

Mode of travel	Distance	Emissions	Annual emissions per commuter trip	Annual emission reduction **	Energy consumption walking and cycling ***
Route suggestion 1	18,9 km	1,3 kg	576 kg	510 kg	293 kJ / 70 kcal = 1,5 pieces of chocolate
Route suggestion 2	19,9 km	1,3 kg	568 kg	518 kg	147 kJ / 35 kcal = 1 pieces of chocolate
Route suggestion 3	17,3 km	0,3 kg	114 kg	972 kg	188 kJ / 45 kcal = 1 pieces of chocolate
Cycling	14,4 km	0 kg	0 kg	1086 kg	1503 kJ / 359 kcal = 7 pieces of chocolate
Walking	14,4 km	0 kg	0 kg	1086 kg	3006 kJ / 718 kcal = 14 pieces of chocolate
Car	14,4 km	2,5 kg	1086 kg	0 kg	0 kJ / 0 kcal = 0 pieces of chocolate

average car.



But first find the right things to do&

Learn from

- Customer needs & appetite
- Effect on sustainability awareness
- Small scale impact on CO2 reduction
- Coalitions & Cooperation
- Multiple technical solutions
- Innovative funding

Determine

- Customer needs and wishes
- Optimized Customer approach
- Ideal cooperation's
- Scalability characteristics
- Best CO2 cases





Policies

Green procurement – allow only companies with a green fleet.
Give room for demonstration projects.





Policy Frameworks / roadmaps



The U.S. planning context

National (Federal)

- Vehicle and fuel standards and fuel pricing
- Transport planning – procedural requirements, funding, and technical assistance

State

- Transport investment priorities (non-metropolitan)
- Roadway design standards
- Freeway/arterial systems management
- Roadway and fuel pricing

Regional (MPO)

- Transport investment priorities (metropolitan)
- Transit investment
- Freeway/arterial systems management
- Voluntary cooperation on land use, etc.

Local (City, County, Town)

- Land use planning
- Local transport investment priorities & design standards
- Bicycle and pedestrian infrastructure



Europe's Transport Challenges

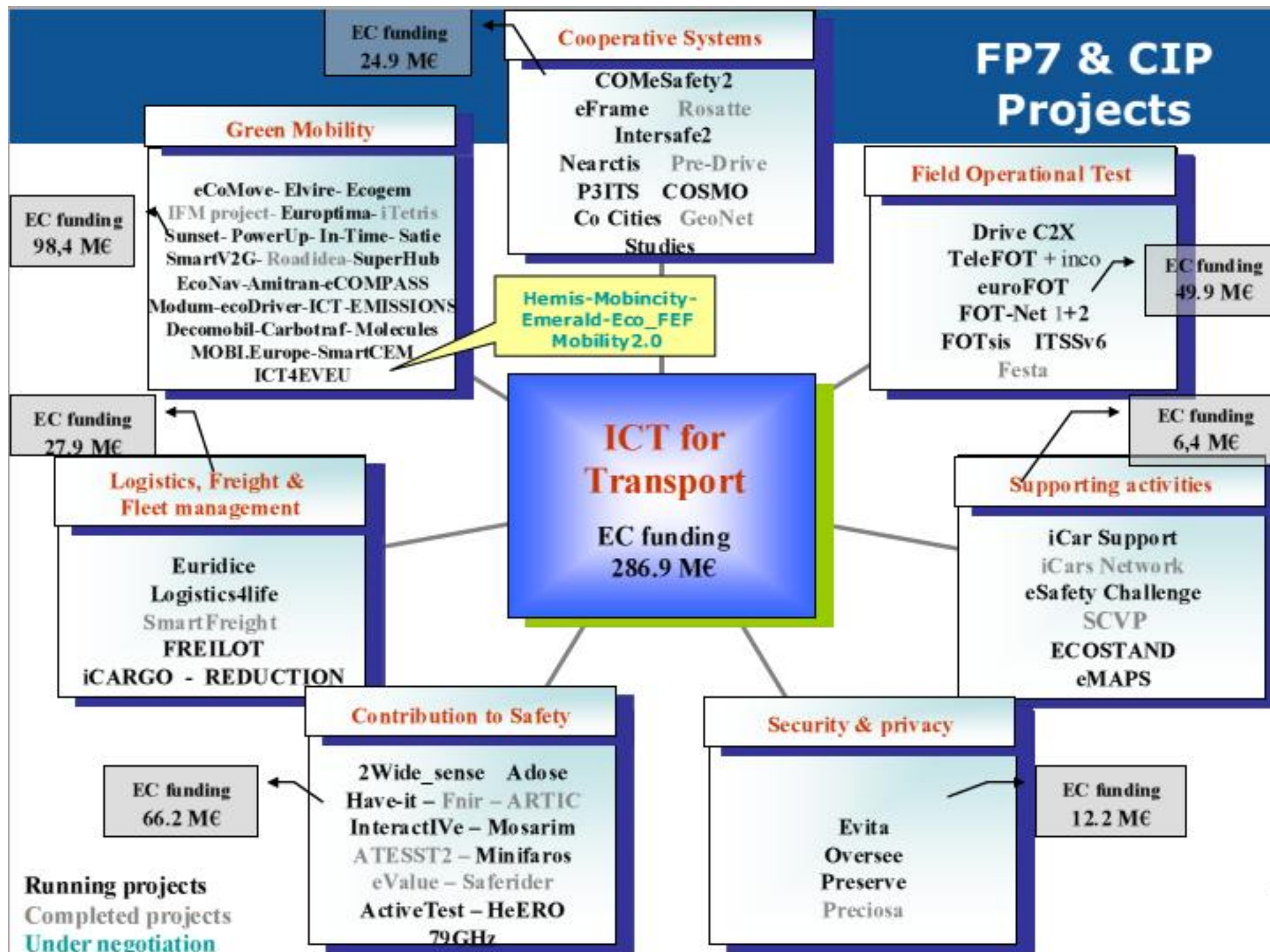
The White Paper 2011

Roadmap to a Single European Transport Area

Towards a competitive and resource efficient transport system

- **To meet the challenges, transport has to:**
 - Use less energy
 - Use cleaner energy
 - Exploit efficiently a multimodal, integrated and 'intelligent' network
- **Curbing mobility is not an option**
- **By 2050 reduce emissions by 60%, and 20% by 2020 (2008 level)**
- **By 2050 move close to zero fatalities** in road transport, halving road casualties by 2020







3. Suggestions to International Cooperation (China)

- Increase the investment in R&D
- support cross-industry technology development.
- Offer purchase allowance and tax reduction
- finance supports to developments of charging facilities and battery recycling systems



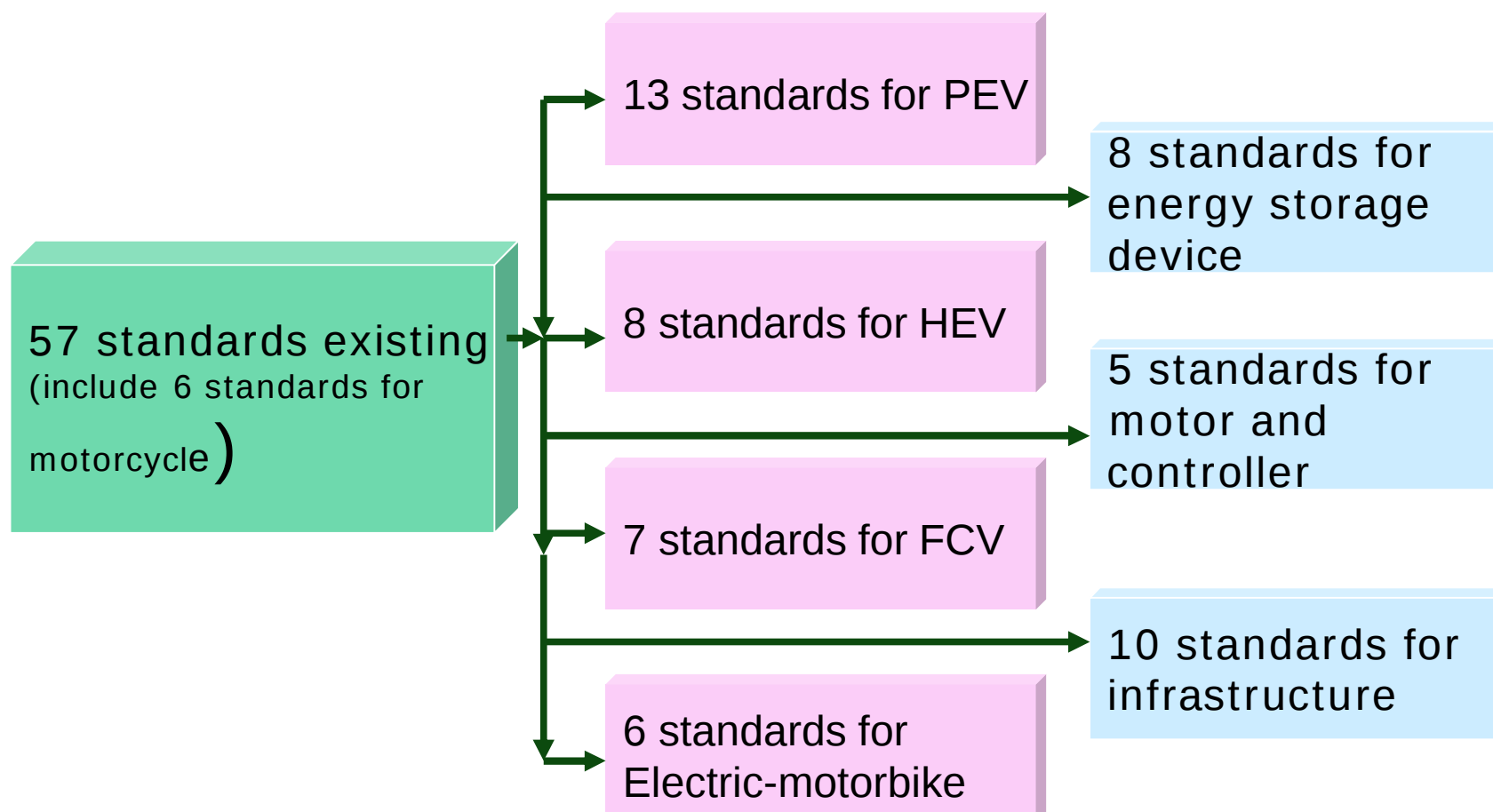
Suggestions

Researches on charging mode, commercial mode and standardization of PEV

Policies to stimulate the use of PEV

- No license control
- No plate number limitation
- Permission to use bus lane, and
- Parking priority

The construction of standard system for electric vehicle



There are 11 standards which have been revised and to be ratified, 14 standards being made or revised, and no standards to be re made. But 45 items of standards are needed in the industry, and the standard system for electric vehicle is the largest in both aspects of coverage and quantity around the world.



Some barriers to further EV charging deployment

Various regional standards for connectors, especially for DC fast charging.

More important than connector type is achieving as much commonization as possible in major portion of the communications protocols

	CHAdeMO (Japan)	GB/T (China)	COMBO1 (US)	COMBO2 (Germany)
Connector				
Vehicle Inlet				
	CAN		PLC	

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The Questions



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Additions – remarks?

