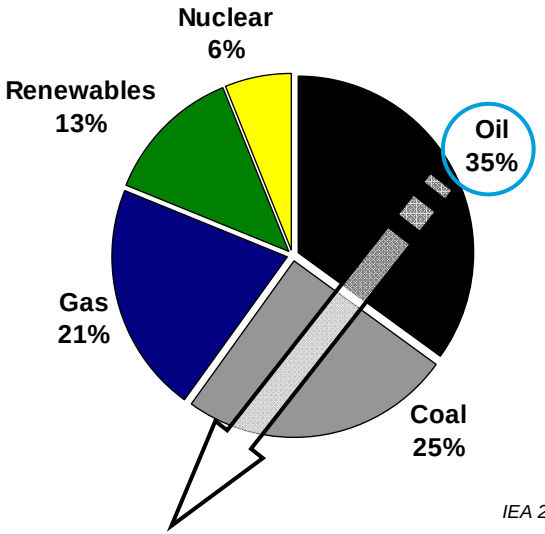
„Challenges ahead for a sustainable energy future“

14th International Gas and Electricity Summit
Paris, 22nd October 2009

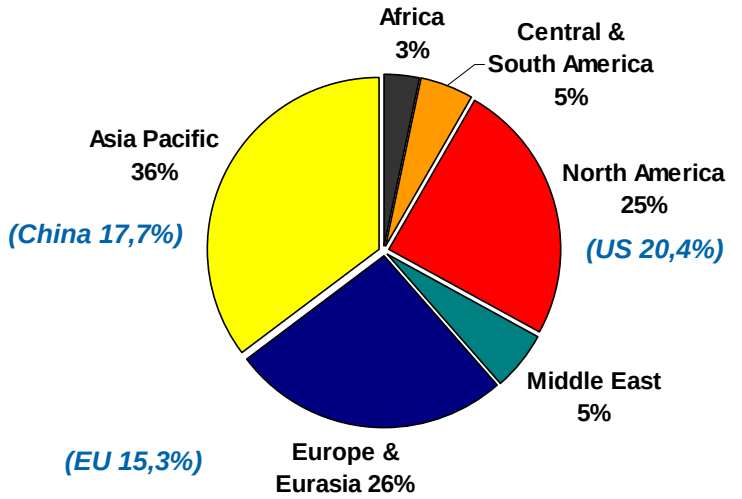
Wolfgang Anzengruber, CEO Verbund

global energy mix



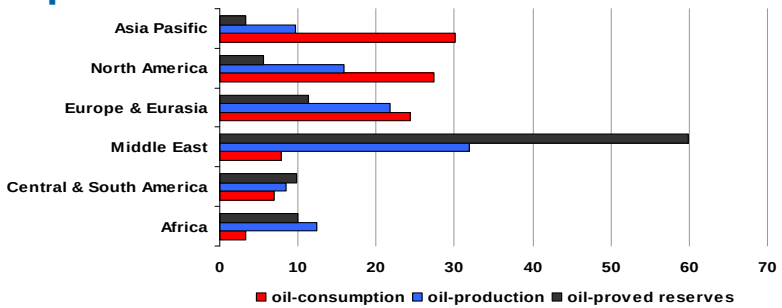
IEA 2008

global energy consumption



BP Statistical Review of World Energy, 2009

global distribution of consumption, production and reserves of oil in 2008



BP Statistical Review of World Energy, 2009

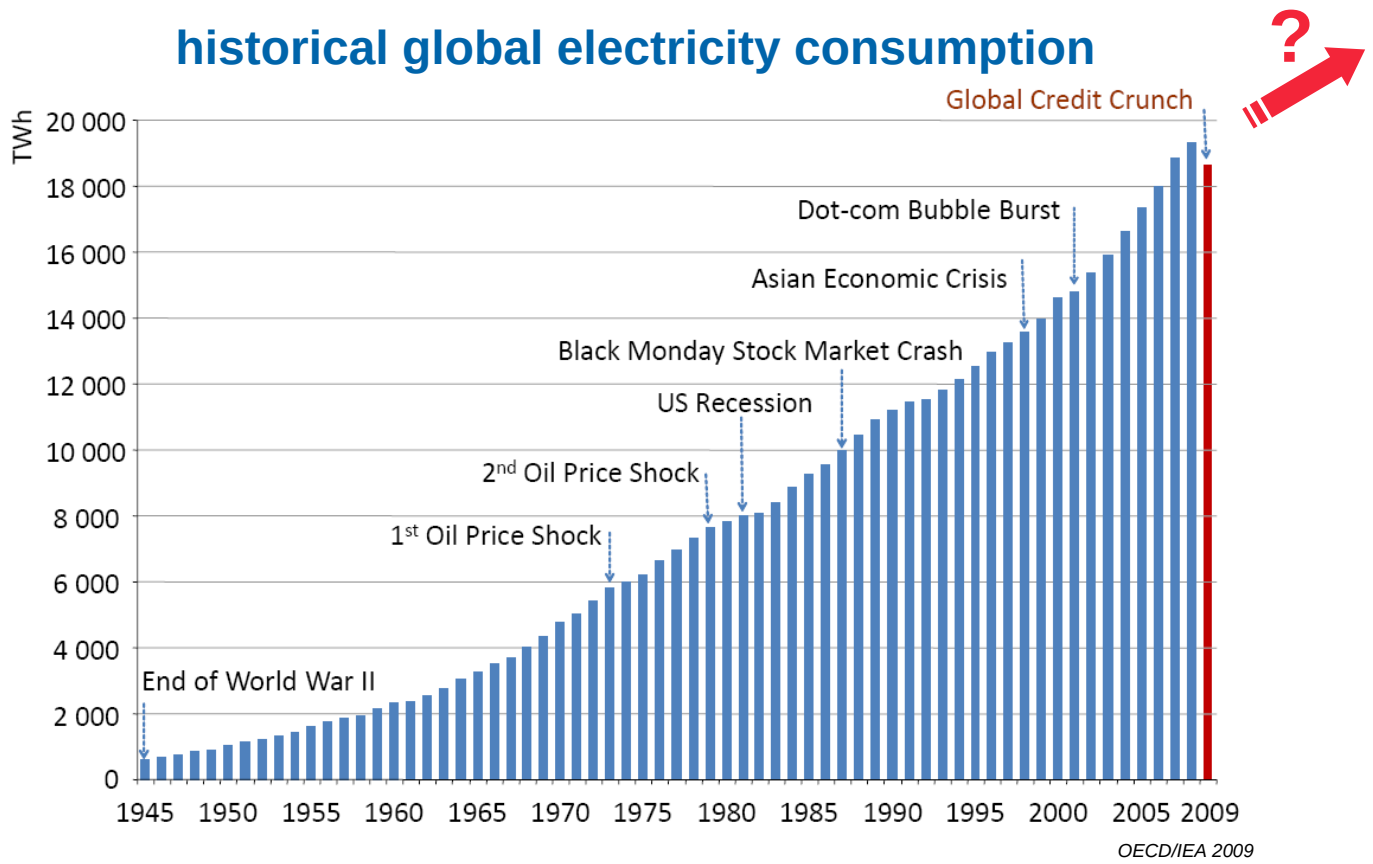
perspective: further massive increase of *global energy consumption*

- plus 45% global energy consumption until 2030
- 50% of the additional consumption by China and India
- *with a „business as usual" development* the energy mix will still be based primarily on fossil fuels in 2030

IEA 2008

Increase in electricity consumption is historically strongly linked to our welfare growth

historical global electricity consumption



→ **Electricity consumption is going to decrease 2009 for the first time since 1945.**

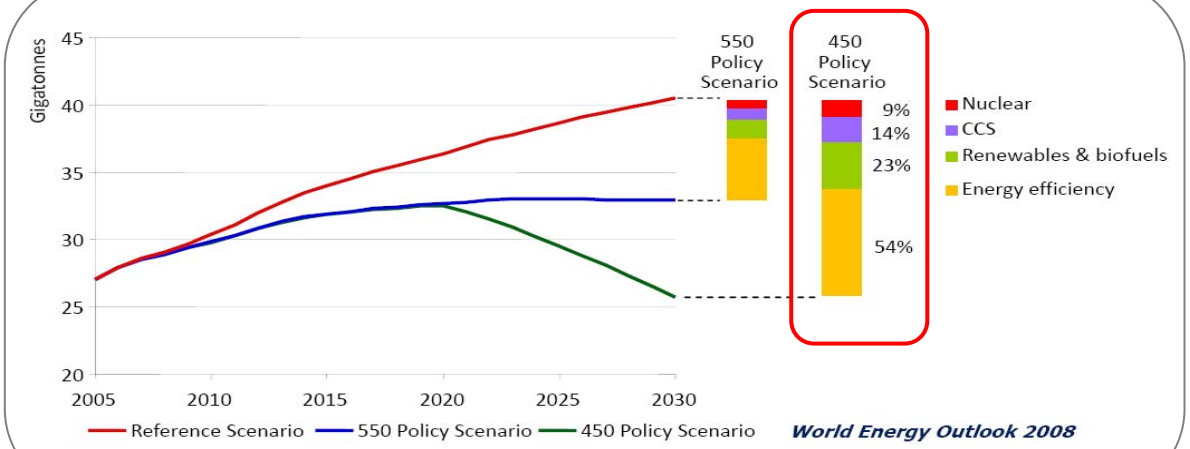
→ **Further increase of electricity consumption is projected, but electricity will also play a vital part in solving the global energy challenges.**

Global climate change: required reduction of greenhouse gas emission calls for a new energy age

COP15 COPENHAGEN

UNITED NATIONS CLIMATE CHANGE CONFERENCE DEC 7 - DEC 18 2009

http://en.cop15.dk/ | http://unfccc.int



450 policy scenario:

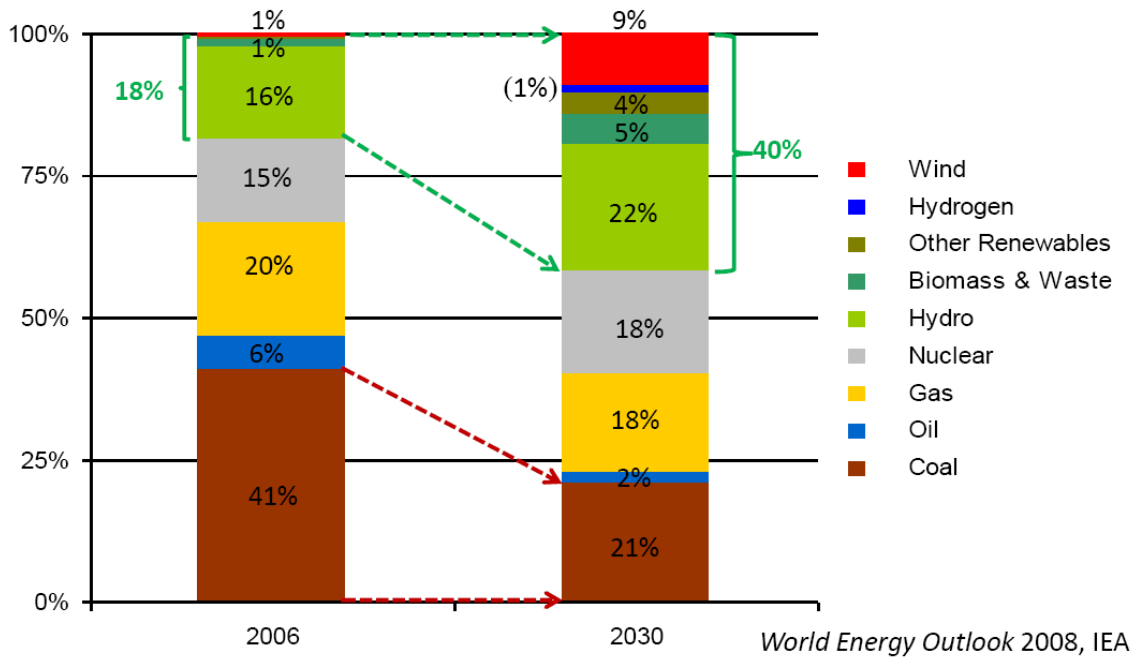
Measures in the energy sector *which might be taken in order to fulfill a coordinated global commitment* ***to stabilize the concentration of greenhouse-gas-emissions in the atmosphere*** *at 450 ppm CO_2-equivalent (stabilization of global temperature increase to 2°C)*

Are we already on the way to a „low carbon economy“?

Will there by a strong international commitment at the UN Climate Change Conference in Copenhagen?

A change of the global electricity generation mix is needed for reaching ambitious climate change targets

global electricity generation
in the 450 policy scenario

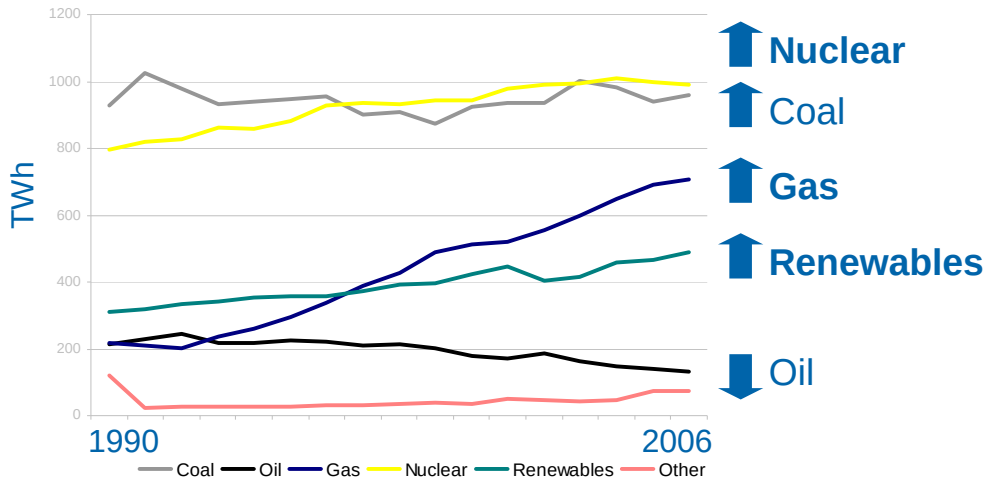


World Energy Outlook 2008, IEA

- → **Share of renewables and nuclear power goes up.**
- → **Hydropower has the potential to be the largest source of electricity in the 450 policy scenario by 2030.**
- → **Coal will remain as one of the largest electricity sources: while the share of coal halves, the absolute installed capacity will be stable.**

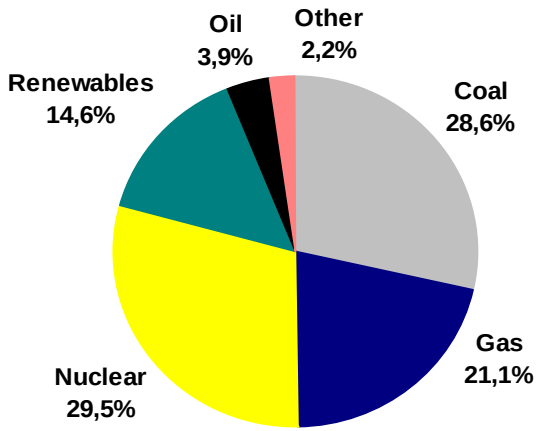
EU-27 electricity generation mix in the context of rising electricity consumption

EU-27 electricity generation in TWh from 1990 to 2006



European Commission 2009

EU-27 electricity mix in 2006

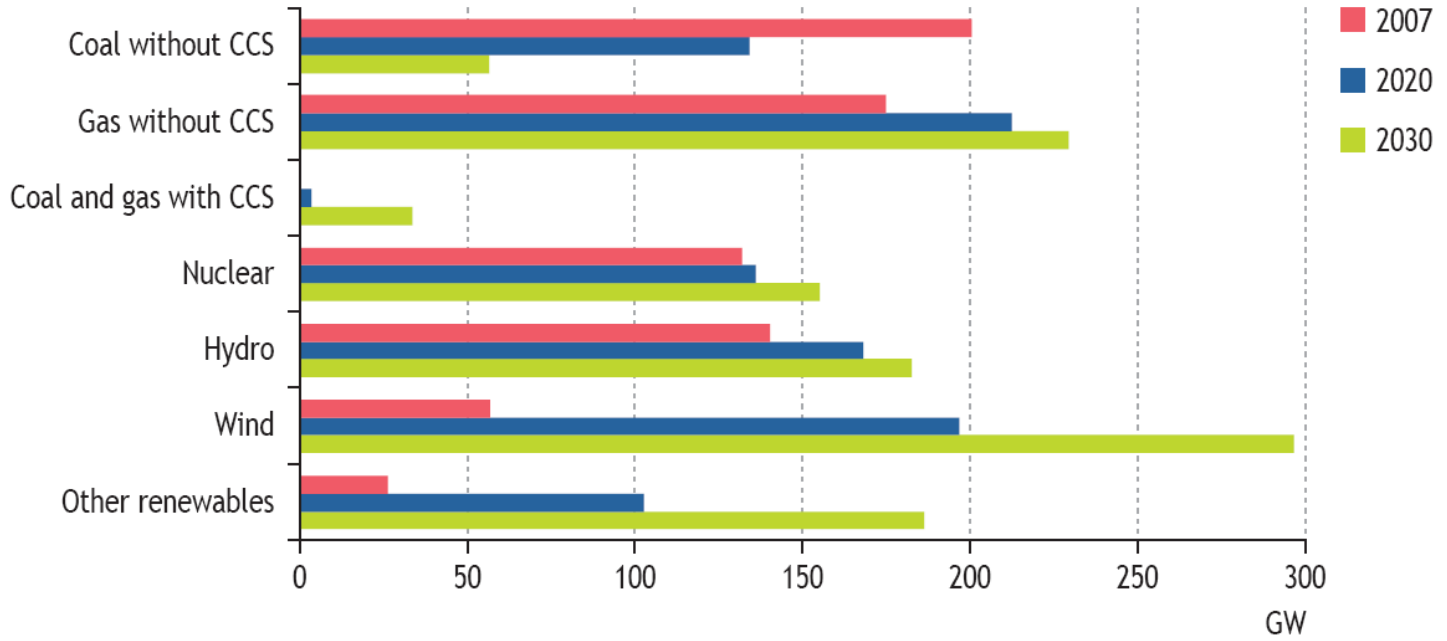


European Commission 2009

- → **Plus 30% electricity production from 1990 to 2006**
- → **Increase in electricity generation is dominated by gas and renewables. In 2008 wind power capacity increase by highest figures of all technologies** *(plus 8,5 GW)*
- → **EURELECTRIC CEO declaration: carbon-neutral power supply in Europe by 2050**

IEA technology outlook for a "climate friendly" power generation capacity mix in the EU-27

EU power generation capacity *in the 450 policy scenario*

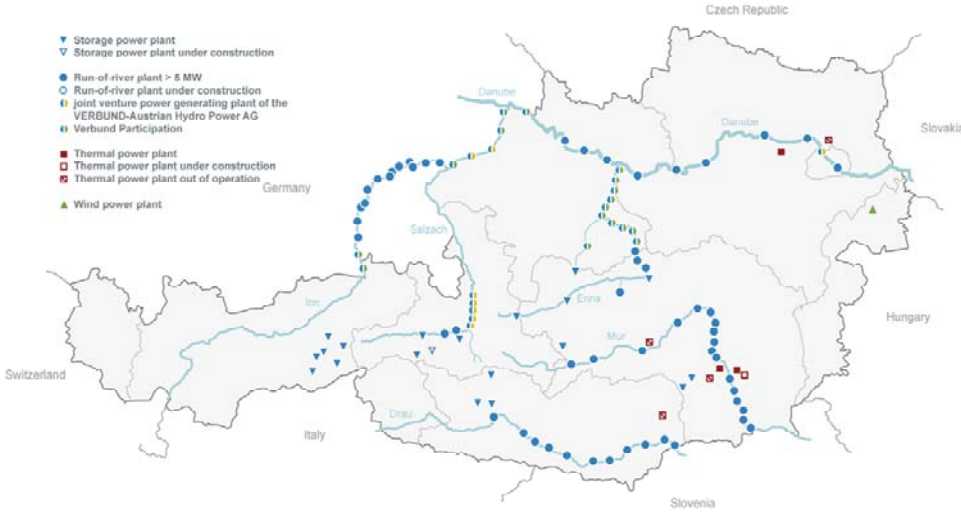


OECD/IEA 2009. Special early excerpt of the World Energy Outlook 2009 for the Bangkok UNFCC meeting

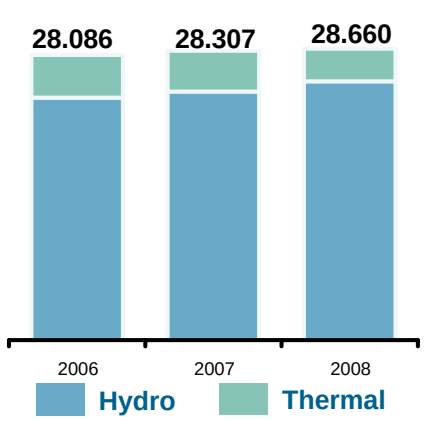
- → **Needed power generation mix would boost renewables.**
- → **Energy infrastructure, especially grids and storage possibilities have to solve immense challenges.**
- → ***Are we ready in Europe for such a transformation of our electricity system?***

- Austria's **largest producer** and transporter of electricity.
- 86% of generation from **hydropower**.
- Austria's biggest **new entrant** in supply business.
- One of the **leading hydropower producers** in Europe.

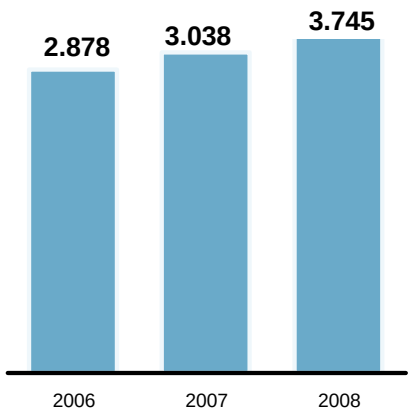
Verbund power plants



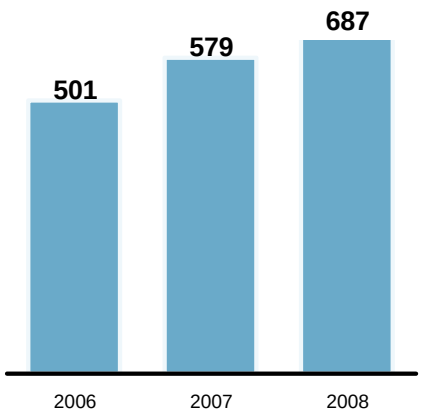
produced electricity (GWh)



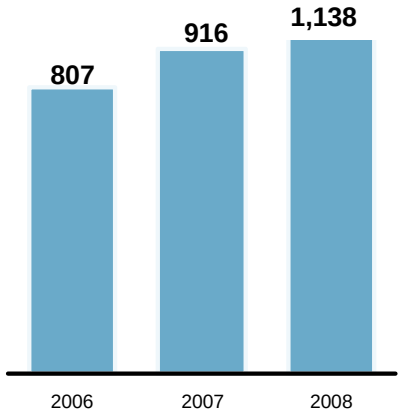
sales (€m)



net income (€m)



EBIT (€m)



Verbund strategy (1): focusing on core countries & technologies

POWEO

- **Focus on CCGTs and renewables**
- First CCGT (Pont sur Sambre) under construction (412 MW), second (Toul) under development (400 MW)
- **Verbund's position:** 2006 purchase of 25% of Poweo SA; since July 2009 shareholding of 43,3%

Core countries: Austria, Germany, France, Italia, Turkey

Acquisition of hydro power plants from E.ON in Germany

- **13 run of river power plants** with a total capacity of **312,2 MW** located along the Inn river
- Total average generation of approx. 1.850 GWh; about **9% of Verbund`s run of river generation**
- Closing of the transaction took place in **August 2009**

SORGENIA

- **Generation:** capacity target 2012 of 5,2 GW
- **Sales:** 500.000 customers (Q2/2009)
- **Verbund's position:** 45% stake, capital increase 2008 and 2009;
- **CIR group as strong domestic partner,**

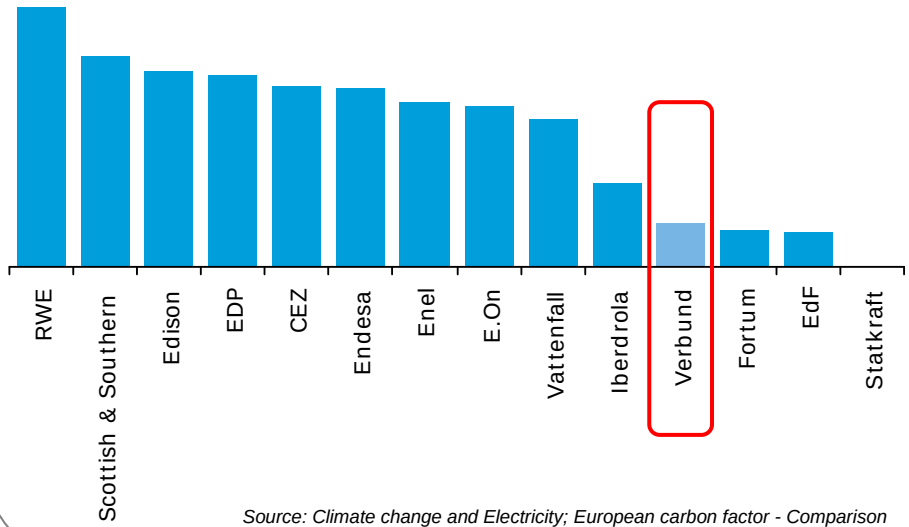
Focus on hydro power, diversification of generation portfolio by gas and wind power

ENERJİSA

- **Verbund partner Sabanci:** joint venture established 2006
- **Development of generation assets:** actual: 455 MW, approved: 2 GW, planned capacity by 2015: 5,2 GW
- **Target market share 2015:** 10%
- **Acquisition** of regional distribution company Baskent EDAS in 2009

Verbund strategy (2): focusing on sustainability and innovation

Comparison of the CO_2 emission [g/kWh] **of European electricity utilities in 2006**



Source: Climate change and Electricity; European carbon factor - Comparison of the CO_2 emissions of Europe's leading electricity utilities; PWC, Nov. 2007

Verbund generation portfolio has one of the lowest CO_2-emissions per kWh in Europe due to our hydro-power based generation.

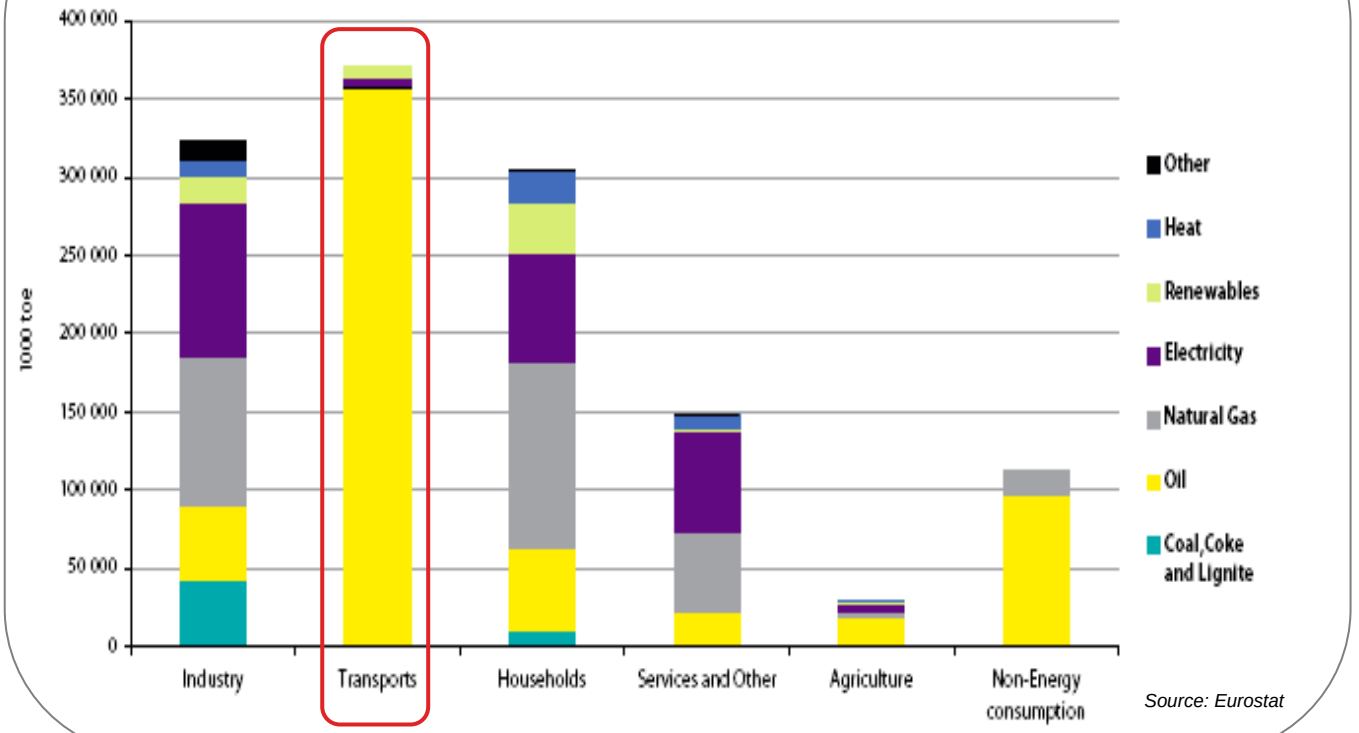
Strategic Vision: *„becoming No. 3 of European hydro-power-producers“*

Riding on new trends as early bird: *e-mobility as new innovation focus*

austrian mobile power · e³mobil · Verbund · SIEMENS · MAGNA STEYR · KTM · AVL · AIT

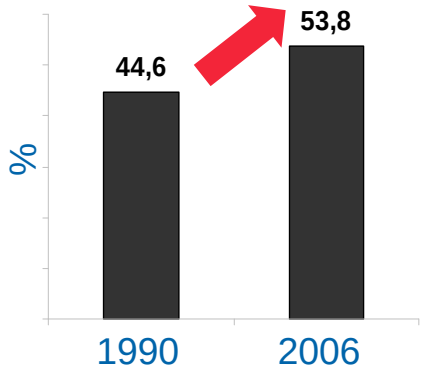
EU-27 energy consumption in the transport sector: one of the main challenges for reaching a sustainable energy future

EU-27 energy consumption 2006



Source: Eurostat

EU-27: 20% increase of energy import-dependency (1990 – 2006)



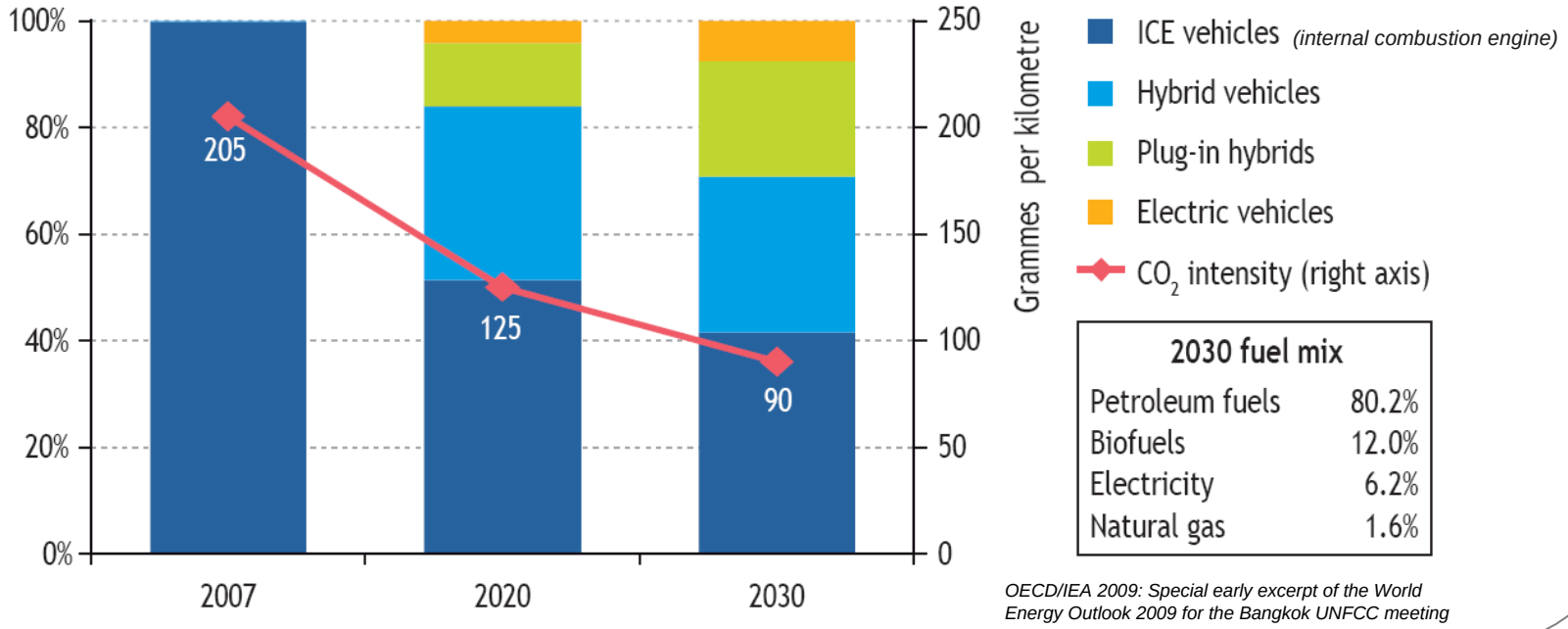
European Commission 2009

→ **Transport sector is the main** (fossil) **energy consumer in the EU-27**

→ **73% of the oil in Europe is needed by the transport sector**

→ **Transportation offers the highest potential for the substitution of fossils fuels by renewables** *(e-mobility!)*

World share of passenger vehicle sales by technology and average new vehicle on-road CO_2 intensity *in the 450 policy scenario*



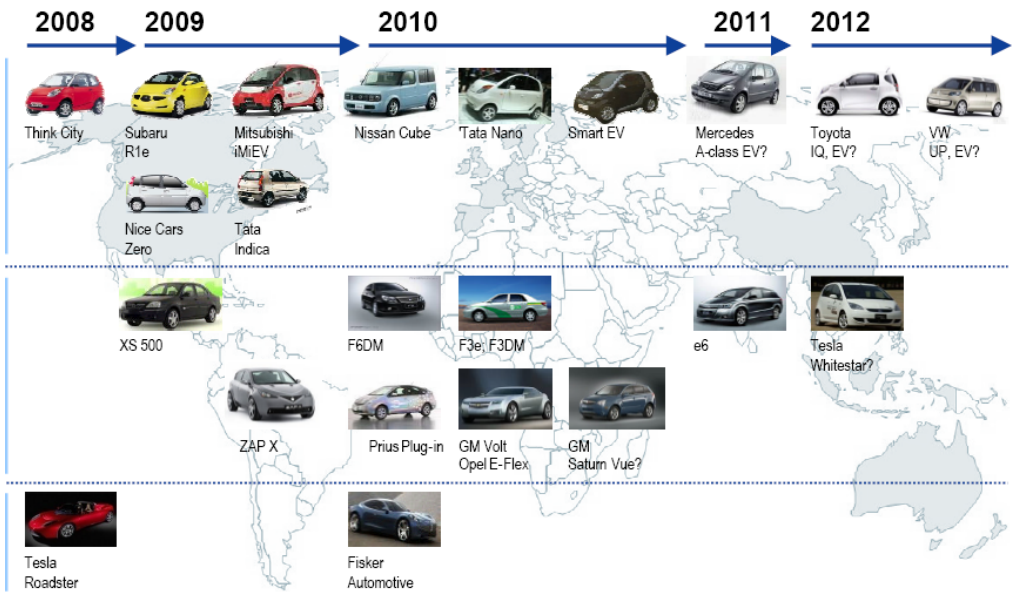
OECD/IEA 2009: Special early excerpt of the World Energy Outlook 2009 for the Bangkok UNFCC meeting

→ **According to IEA estimations** *(450 policy scenario)* **"electric & hybrid vehicles" will play an important role for achieving a sustainable energy system.**

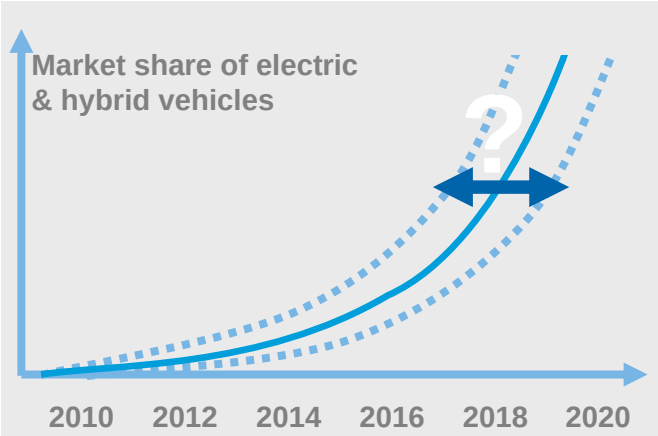
→ **By 2030 the sales of passenger vehicles could already be dominated by new "low carbon" technology, taking into account that the fuel mix will still be based primarily on fossil fuels.**

E-Mobility will come: required time for a broad market penetration is an open question

Planned market entrance of new electric & hybrid vehicles until 2012



Quelle: Daimler / Roland Berger



- → **Estimated market penetration depends on framework conditions**
- → **Broad offer of electric & hybrid vehicles should exist by 2012/2013**
- → Estimations for Germany:
  2020: 1 Mio. – 4,5 Mio. vehicles
  2030: 6 Mio. – 14 Mio. vehicles
- → Estimations for Austria:
  2020: 150.000 - 500.000 vehicles

Concluding remarks:

- → Energy mix **will further be dominated by fossil fuels** in the next decades.
- → **Energy** is **not only part of the problem**. **Energy also plays an important role in solving** the global climate change & energy challenges.
- → **Nuclear energy** contributes its part, but provides **not a long-term solution.**
- → **Hydropower** represents **the energy source from renewables**, which is **economically competitive without subsidies**.
- → **Utilities** have not only a task for producing electricity, they **also have to focus on the consumption side *(smart metering, e-mobility).***