EV-STEP:

Sustainable Technology and Economic Pathways for
Electrified mobility systems in EU-27 by 2030

Edi Assoumou
Mines ParisTech, CMA
The Electromobility + frame

**Electromobility +**

- Transnational research framework (FP7) involving 11 European countries and regions
- Aiming at “creating long-lasting conditions for the roll-out of electric mobility in Europe on the horizon of 2025”
- 5 thematic scopes:
  - Energy and environmental policy approach
  - Usage patterns, economic models, actors involved
  - Technical dimensions of the recharging systems
  - Testing, trials and normative standards
  - Technology based Innovation
- 18 research projects
A project focusing on the long-term strategic analysis: technology choice, energy balances, emissions, economics.

Assessing the conditions and implication of an enhanced development of pure or plug in hybrid electric vehicle through modelling.

- The partners behind EV-STEP:
  - MINES ParisTech
  - IER
  - DTU
  - ARMINES-CMA
  - USTTUT-IER
  - RISOE-DTU
  - SMASH-CIRED
**EV-STEP’s R&D approach**

- **Strategic EU wide focus:**
  - Technical assessment
  - Economic impact

- **Specific insights**
  - Mobility patterns & load curve at local scale
  - Renewable and balancing issues
  - Models and case studies for Denmark, France, Germany
The Pan-European TIMES model

- A technology oriented bottom-up model with:
  - 31 regions (EU 28 + NO, CH, IS)
  - Time horizon: 2000-2050
  - 12 time slices (4 seasonal, 3 day levels)
  - GHG: CO2, CH4, N2O, SF6
  - Others pollutants: SO2, NOx, CO, NMVOC, PM2.5, PM10

- Partial equilibrium of the energy system and cost minimization

“The role of Electrical vehicles in Europe”, Markus Blesl
The IMACLIM-P model

- A recursive, computable general equilibrium model:
  - Exogenous growth through labour productivity
  - EU28 as a whole, horizon and time steps consistent with PEM
  - Balanced economic flows of 11 goods, labour and capital
  - Exogenous firms’ input and households’ consumption trade-offs

“A TIMES Pan-EU/IMACLIM bottom-up/top-down linkage: application to a prospective Outlook of electric vehicle penetration in EU28, Frédéric Ghersi

TIMES-CGE Workshop: Wednesday
Specific insights and case studies

- Paris IDF region and the EV-CAP model
  - Local mobility survey + MIP optimization + price signals
  - 15mn time step load curves

  “Model based analysis of the deployment of electric vehicle in the Paris Ile De France Region”, Jérôme Houël

- Electric vehicles, renewables and balancing
  - Hourly time step TIMES model for Germany
  - Balmorel + TIMES based analysis for Denmark

  “Choice of aggregated parameters for integration of electric vehicles to grid in a TIMES model for a region dominated by wind power”, Poul Erik Grohnheit et al.

- Invited insight: electromobility in India

  “India case study - Future of Electric Vehicles in Road Passenger Mobility of India”, Subash Dhar