

Disruptive End-use Energy Innovations and Potential Implications on Demand

Arnulf Grubler IIASA, Laxenburg, Austria

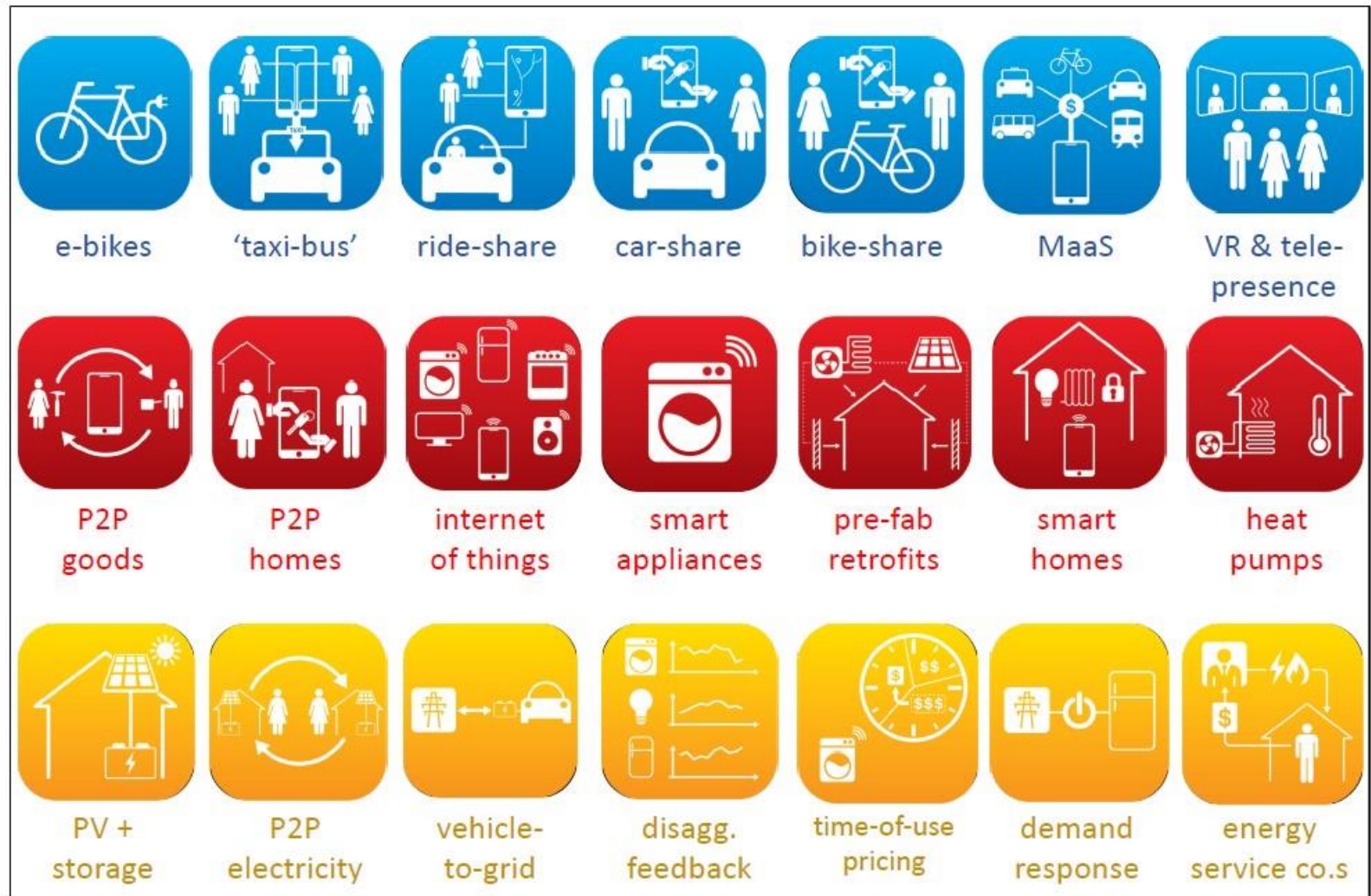
IEA TCP Universal Meeting Paris June 18-19, 2019

Session: *Exploring future energy trends :
innovation priorities and policy implications*

New Trends in Social and Technological Change

- Changing consumer preferences (e.g. diets)
- Generational change in materialism
(service rather than ownership, e.g. only 10% of 19-yr old in Stockholm have drivers license)
- New business models
(sharing & circular economy)
- Pervasive digitalization and ICT convergence
(Society 5.0)
- Rapid innovation in granular technologies
and integrated digital services

Disruptive End-user Innovations



(1) From ownership to usership – (2) Sharing Economy – (3) From atomized to connected

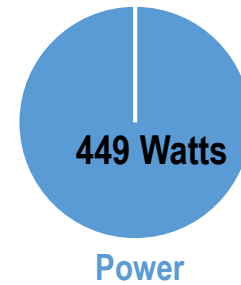
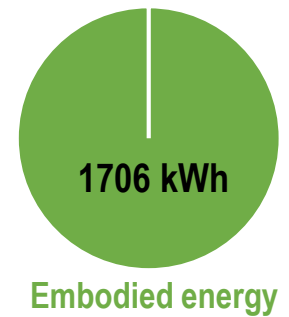
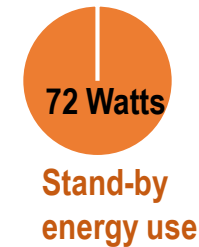
Resource Impacts of Digital Convergence

5 Watts
2.5 Watts

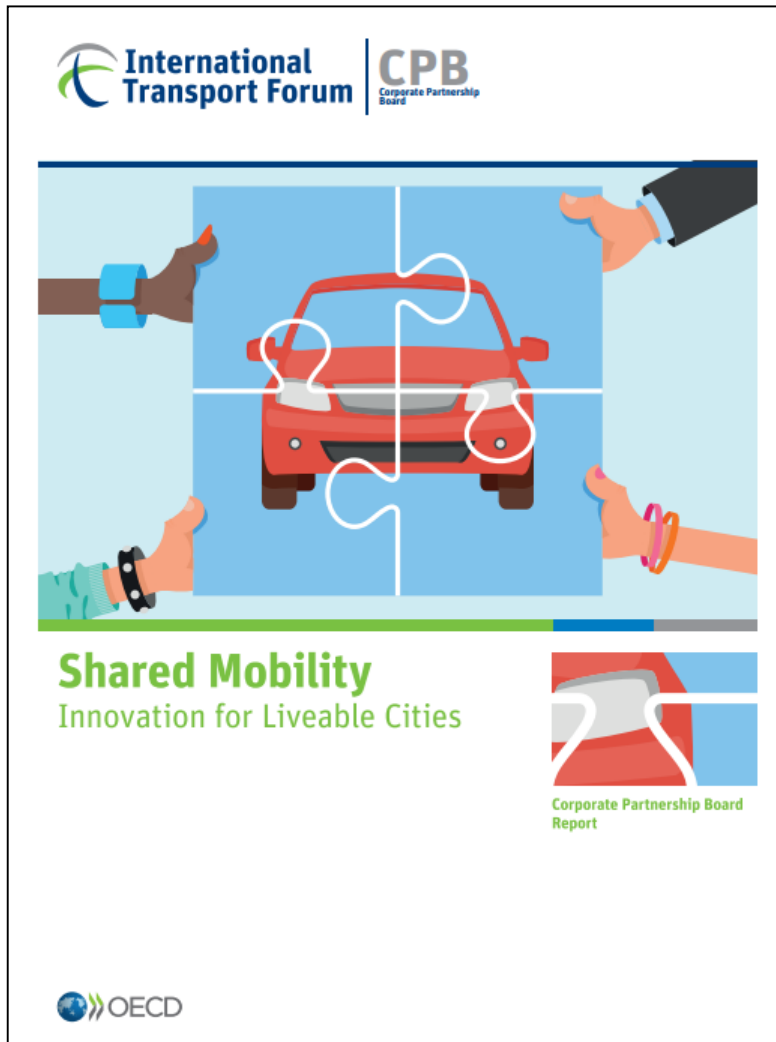
75 kWh
0.1 kg



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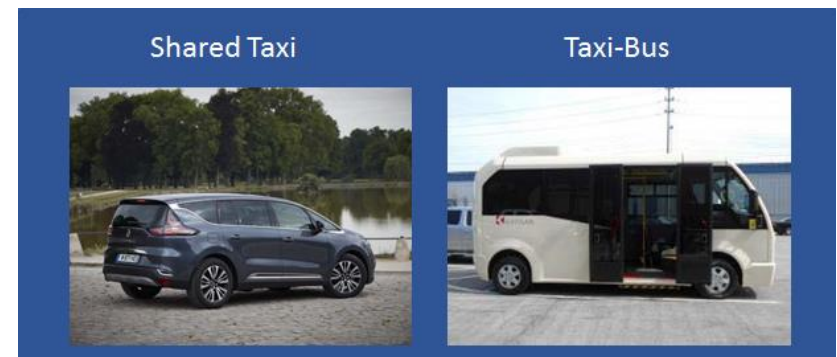
The “Sharing Economy”: Mobility Case Studies



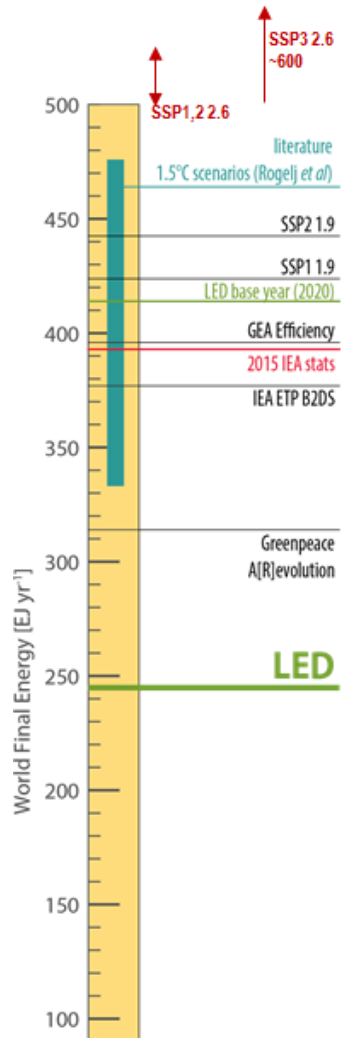
Reductions (%) in shared mobility scenario compared to status quo

	vehicle fleet	con- gestion	mobility costs	CO2 emissions
Auckland	-95%	-49%	-43%	-54%
Dublin	-98%	-43%	-50%	> -31% *
Helsinki	-96%	-37%	-43%	> -34% *
Lisbon	-97%	-30%	-50%	-62%

* IC vehicle fleets, no electrification

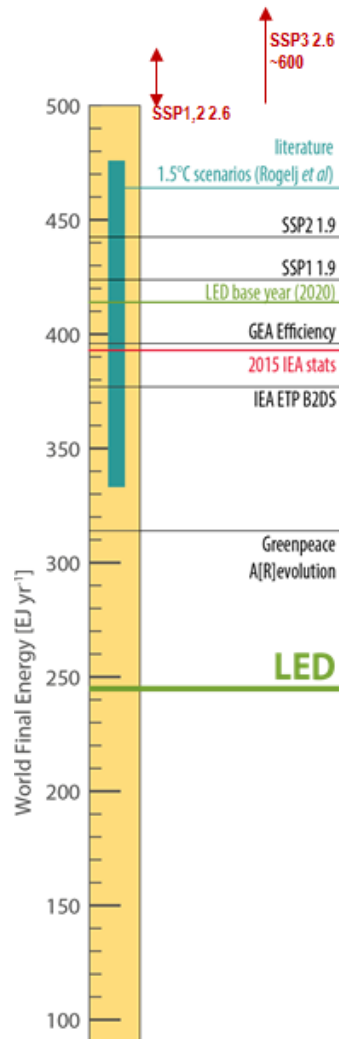
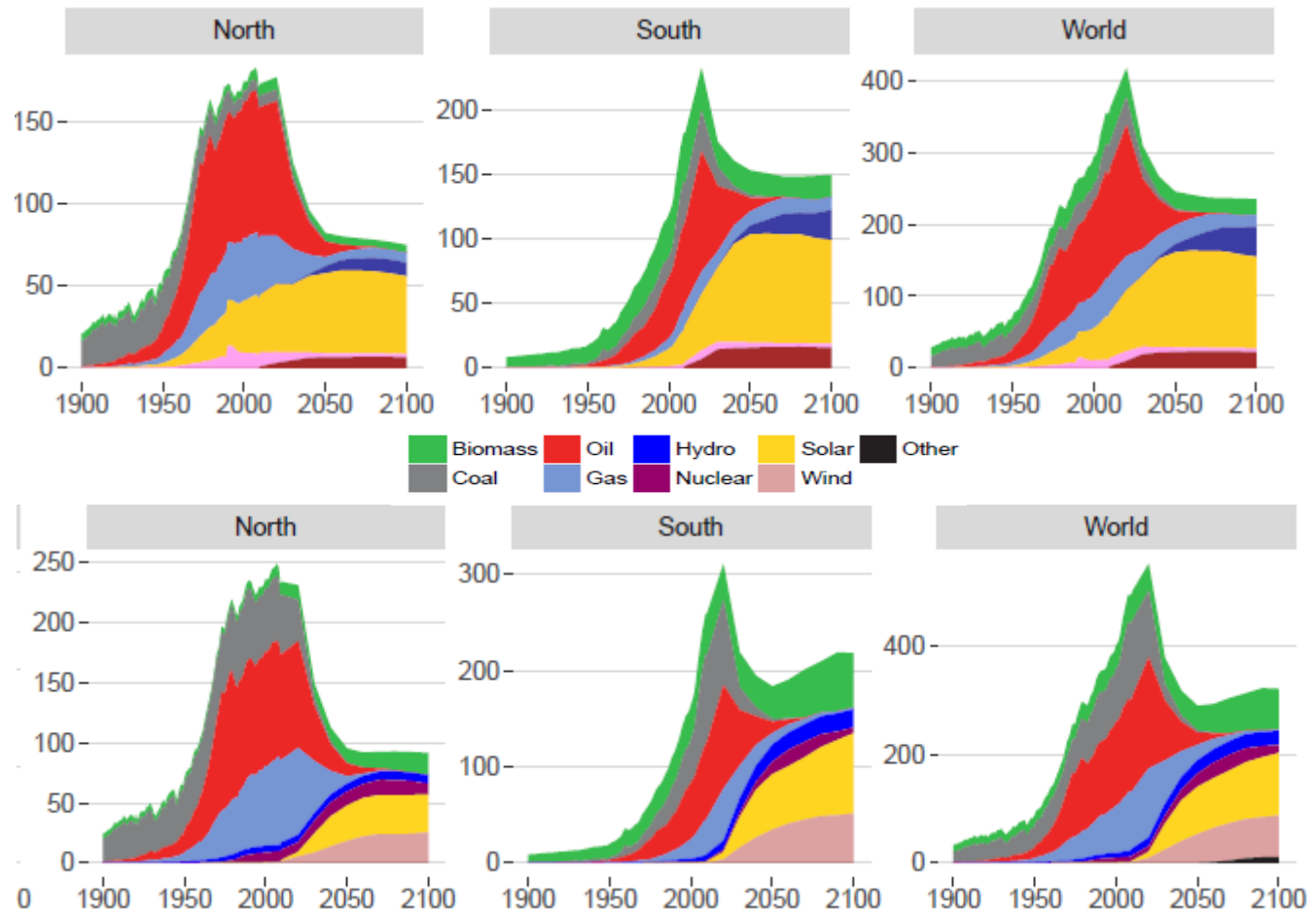


Implications of Demand Transformations: LED Scenario



Low Demand Enables Meeting 1.5 °C without CCS with significant SDG Benefits

Demand - Final Energy EJ LED



Supply - Primary Energy EJ LED

A Low Energy Demand Scenario for Meeting the 1.5°C Target and Sustainable Development Goals without Negative Emissions.

A. Grubler, C. Wilson, N. Bento, B. Boza-Kiss, V. Krey, et al., 2018.

Nature Energy **3**, 515-527

Article + SI
online LED DB:

<https://db1.ene.iiasa.ac.at/LEDDB/dsd?Action=htmlpage&page=10>