

PAUL SCHERRER INSTITUT



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Integrating sustainable development goals into energy systems modelling

ETSAP Webinar series January – February 2022

New energy technologies are needed...

Electrification of heating

Electrification of mobility

Renewable energy supply

(Green) Hydrogen

CO2 capture, utilisation and storage

Negative emission technologies

... with non-energy impacts

Direct costs and burdens

Environmental impacts

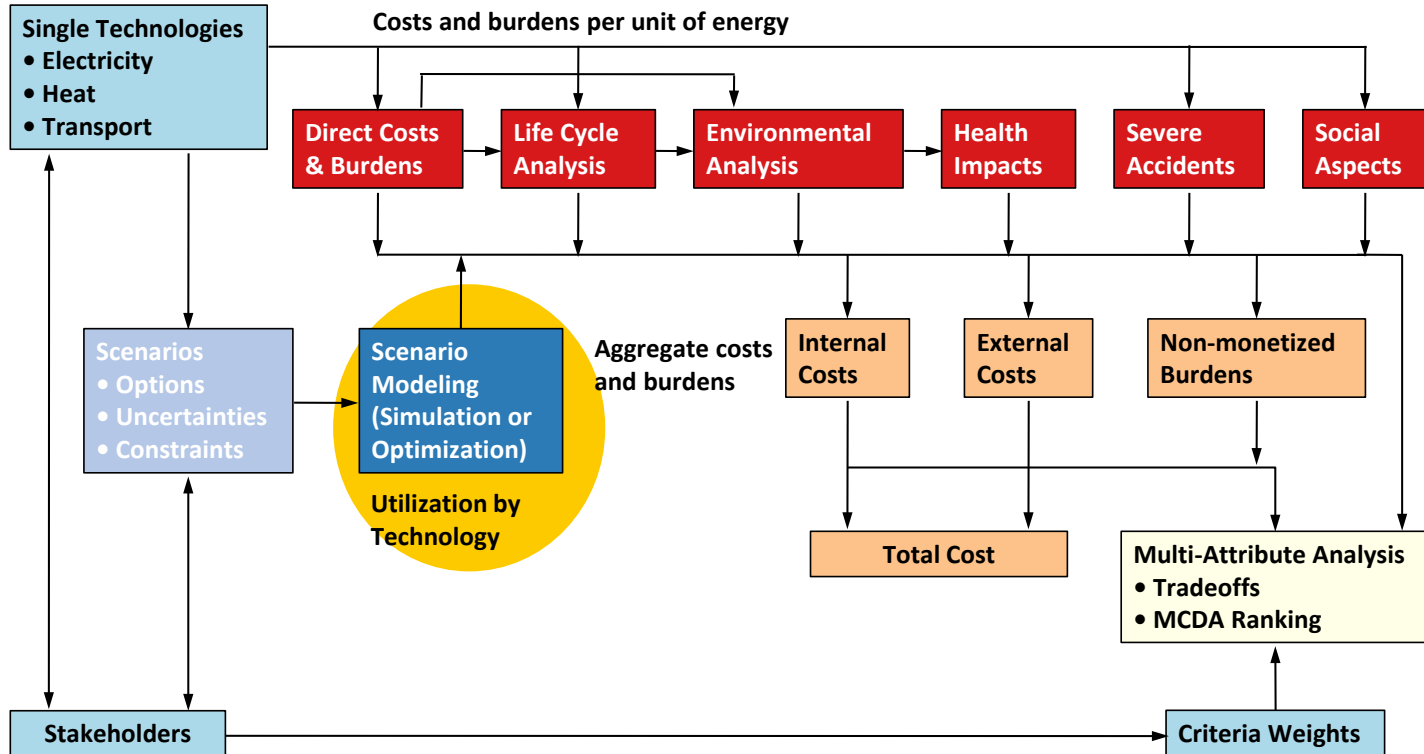
Health impacts

Severe accidents

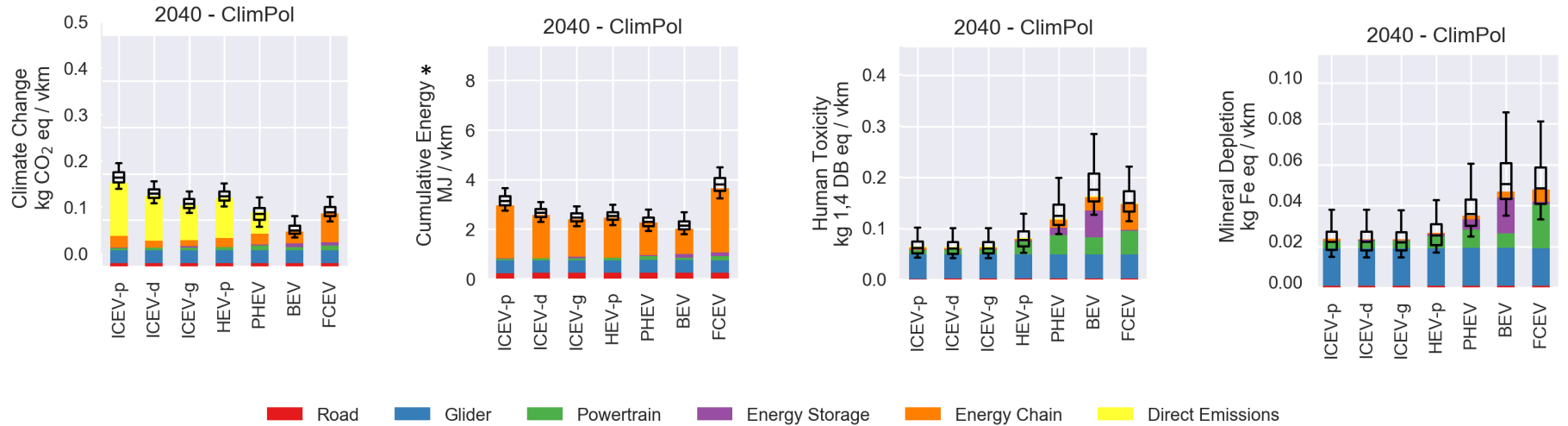
Social aspects

...

Energy Systems Analysis at PSI LEA

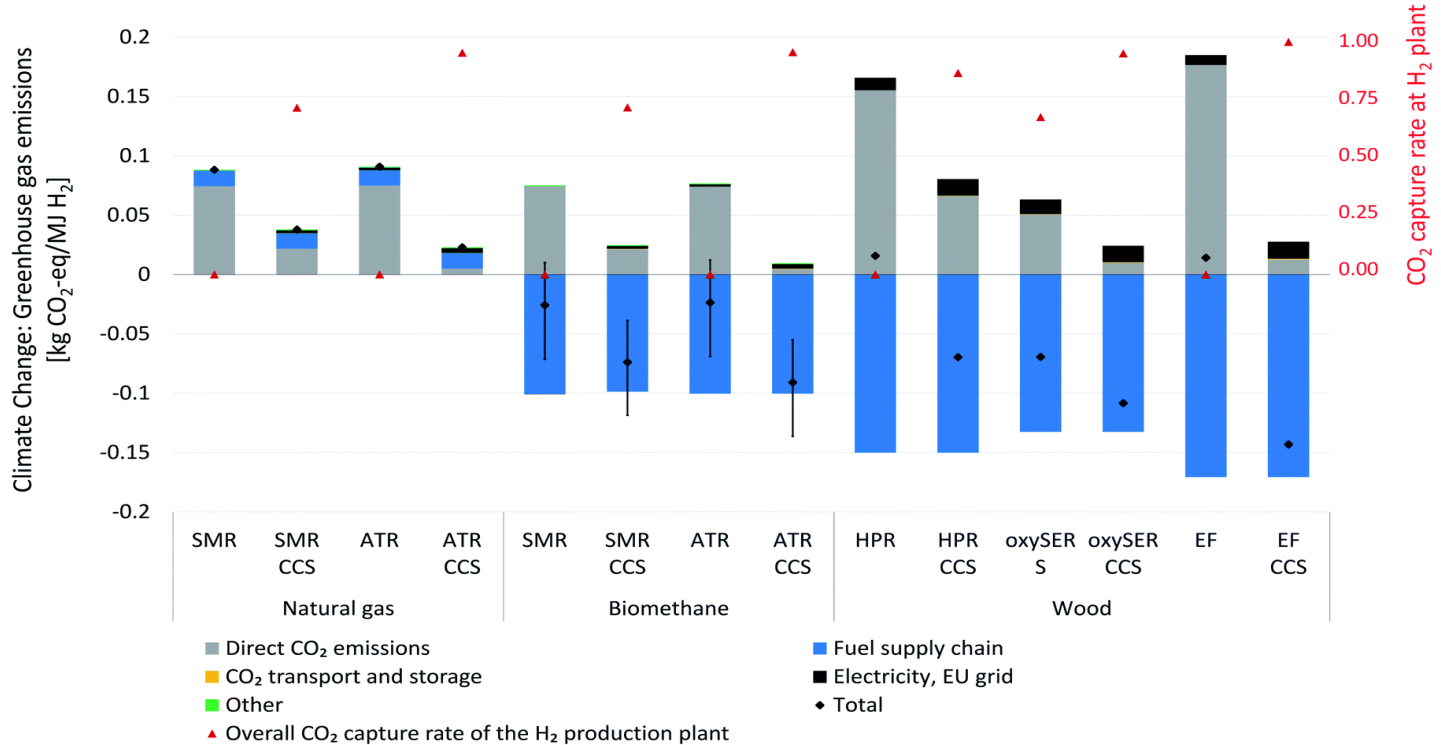


Are electric cars sustainable?



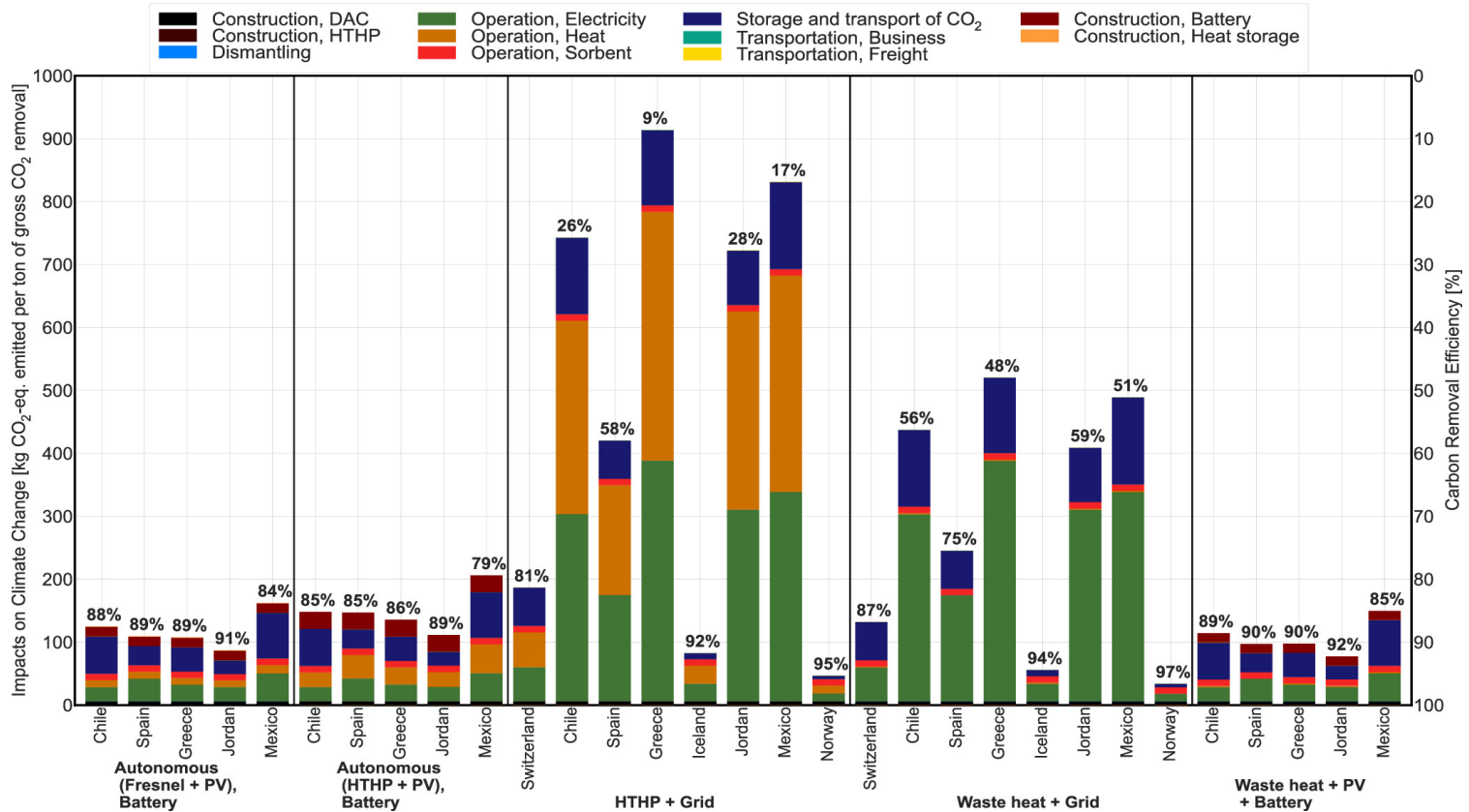
* Cumulative non-renewable primary energy demand results for the entire vehicle life cycle

How green is the hydrogen from gasification?”



EF: Entrained flow gasifier
 SMR: Steam methane reforming
 ATR: Autothermal reforming
 HPR: Heat pipe reformer

How much is the carbon removal efficiency of Direct Air Capture?



Source: Terlouw, T., Treyer, K., et al. (2021). Life Cycle Assessment of Direct Air Carbon Capture and Storage with Low-Carbon Energy Sources. Environmental Science & Technology, doi: 10.1021/acs.est.1c03263

- ETSAP community has performed several model developments and knowledge exchanges, such as:
 - Workshop on modelling the water energy nexus (Zurich 2017)
 - Workshop on sustainable performance of the energy systems (CIEMAT 2017)
 - Workshop on models and applications (Sao Paolo 2017)
 - Linking energy systems models and economic models (UCC, 2014)
- The main objectives of the three workshops are:
 - To analyse methodologies and required data
 - To provide insights on the value added gained for policy analysis
 - To get insights on synergies and trade-offs between SDGs and energy transition

Wir schaffen Wissen – heute für morgen

