

Modeling the impact of energy sufficiency measures in European integrated energy systems using PyPSA-Eur

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Introduction





Introduction

Energy sufficiency, efficiency and clean techs are complementary!





Adapted from B. Best, Suffizienz in deutschen Energiescenarien, 2021

CLEVER Scenario



CLEVER Scenario

LIÈGE université



PyPSA-Eur



Electricity Dispatch in Summer





Methodology

LIÈGE

How to simulate the effect of energy sufficiency measures in a well-established integrated energy system model with an hourly time resolution?



Input Data

Scenario configuration

université



Total Sectoral Demands





Grid + Technology Expansion (BAU)





Grid + Technology Expansion (Suff)





Total System Costs





Conclusions

- It is feasible to reach climate neutrality, in line with the 1.5°C objective, without CCS and new investments in nuclear
- Energy sufficiency significantly decreases the required investments in infrastructure
 - However, even in the sufficiency scenario grid extension is required
 - H2 still plays a significant role as energy vector, albeit lower than in the BAU scenario
- Sufficiency hypotheses are realistic but require behavioral changes on individual and societal level
- 100% energy independence is achieved for the 28 considered countries
- Source code and data are released with open licenses for the sake of transparency and reproducibility



Thank you

