

Sustainability: Concept, Strategies, Dimensions



Agenda

- Role of strategies for climate neutrality (GER)
- Sufficiency
 - Types
 - Uses
 - Potential

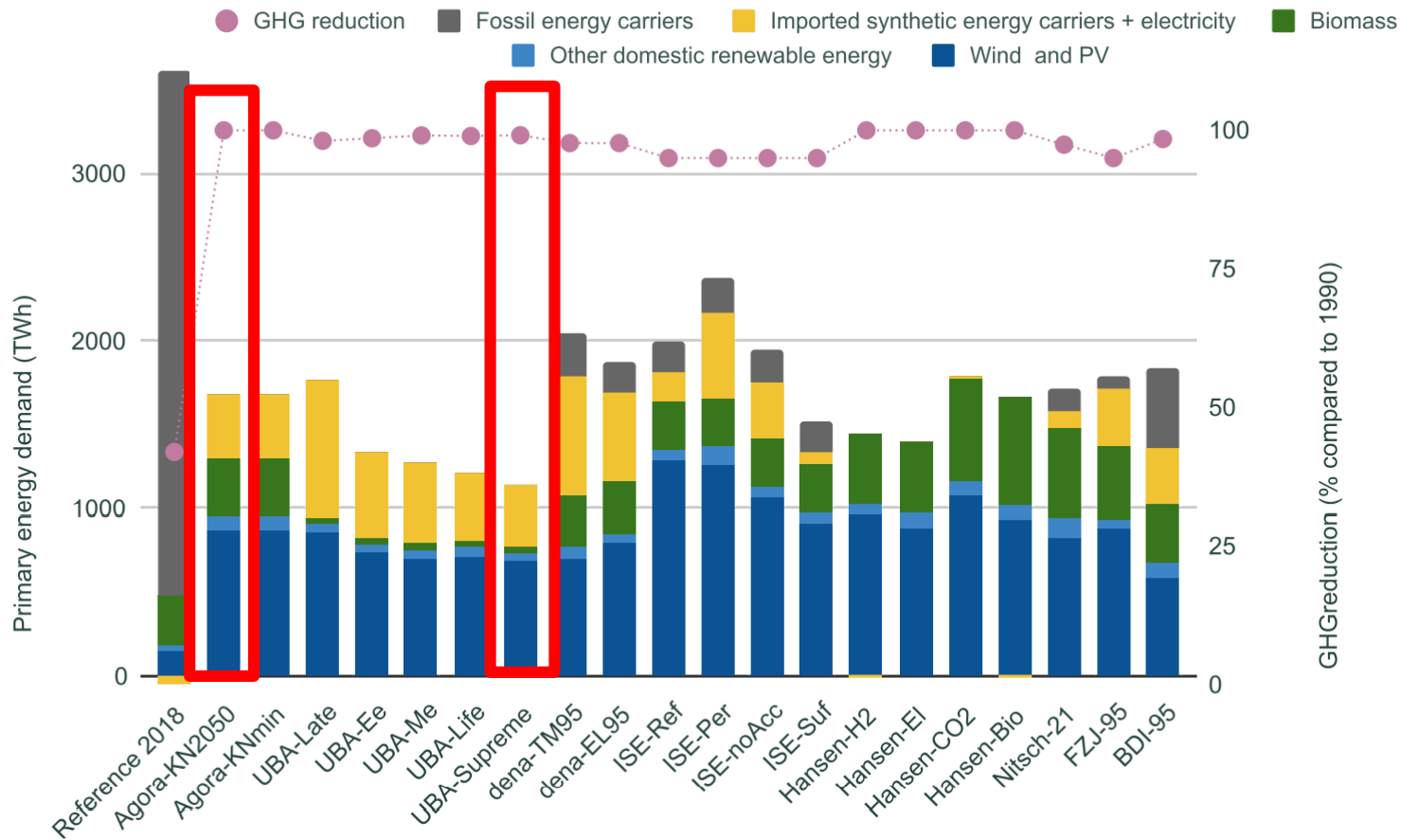
Strategies, **Dimensions** and Side-effects

	Sustainability - matrix				
Dimensions	Environment	Social	Economy		
	Nature, resources	Needs, Ethics	Growth, competitiveness		
Strategies	Efficiency	Consistency	Sufficiency		
	Resource use, input per output	Circular thinking, regeneration time	Reduction, substitution revision of habits		
Criteria	Conservation	Acceptance	Solidarity	Participation	Justice ...
Indicators	Resource use	Fatalities	Access	Costs	...

Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

Total primary energy demand and emission reductions



Focus:
AGORA
UBA Supreme

Role of strategies for climate neutrality

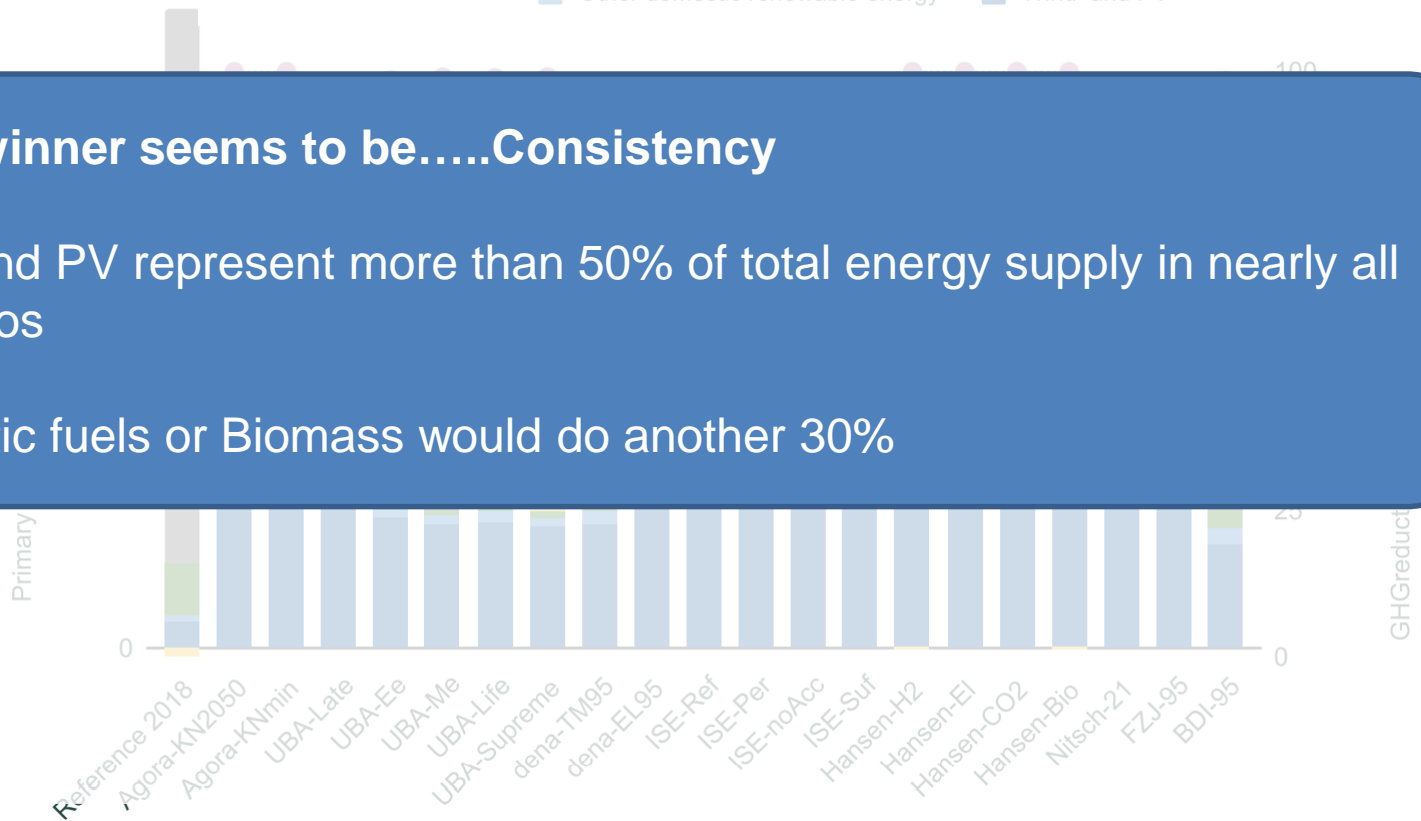
Meta-analysis: energy scenarios in GER (since 2018)

Total primary energy demand and emission reductions



And the winner seems to be.....Consistency

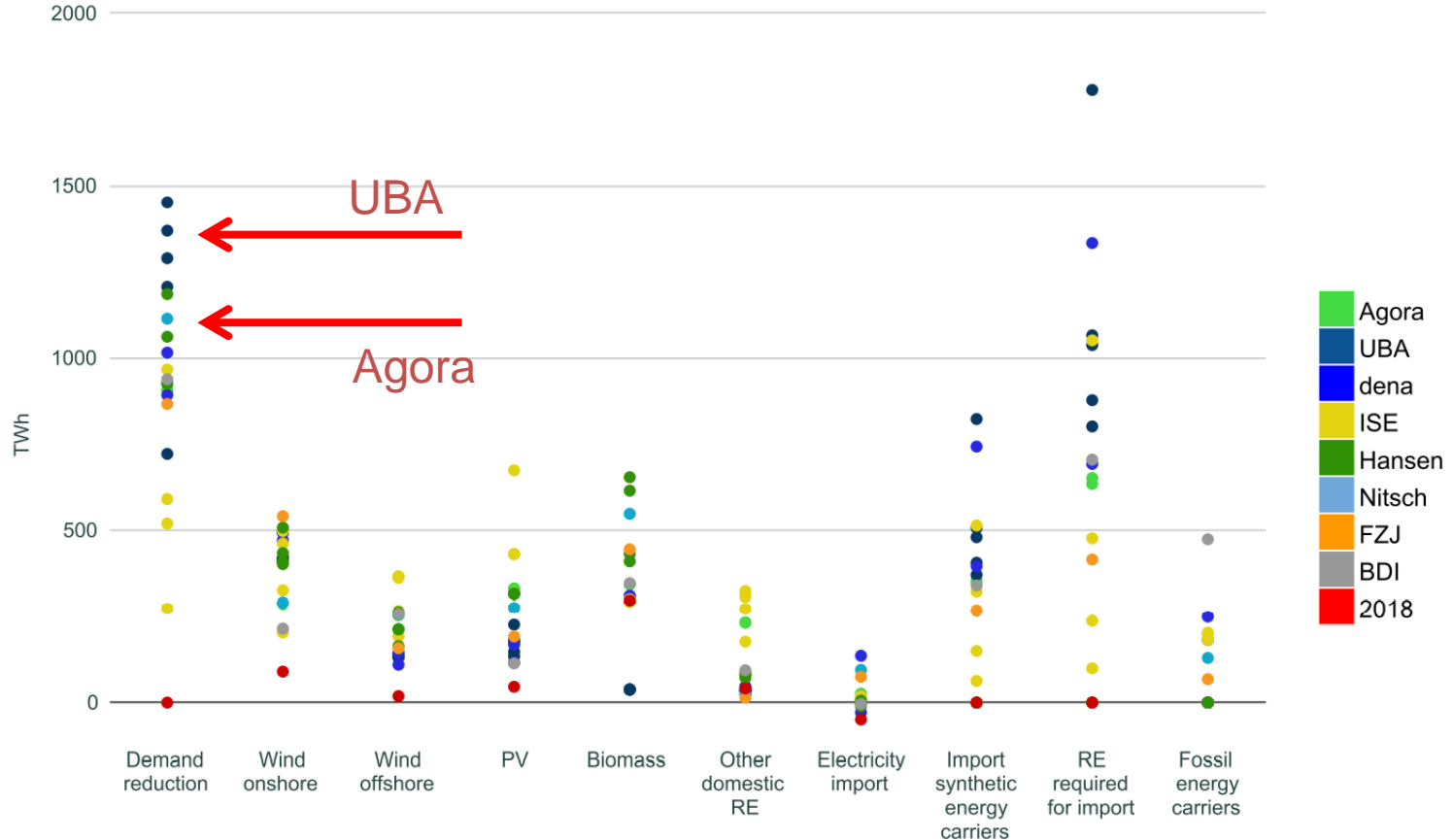
- Wind and PV represent more than 50% of total energy supply in nearly all scenarios
- Synthetic fuels or Biomass would do another 30%



Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

Energy balances



Note:

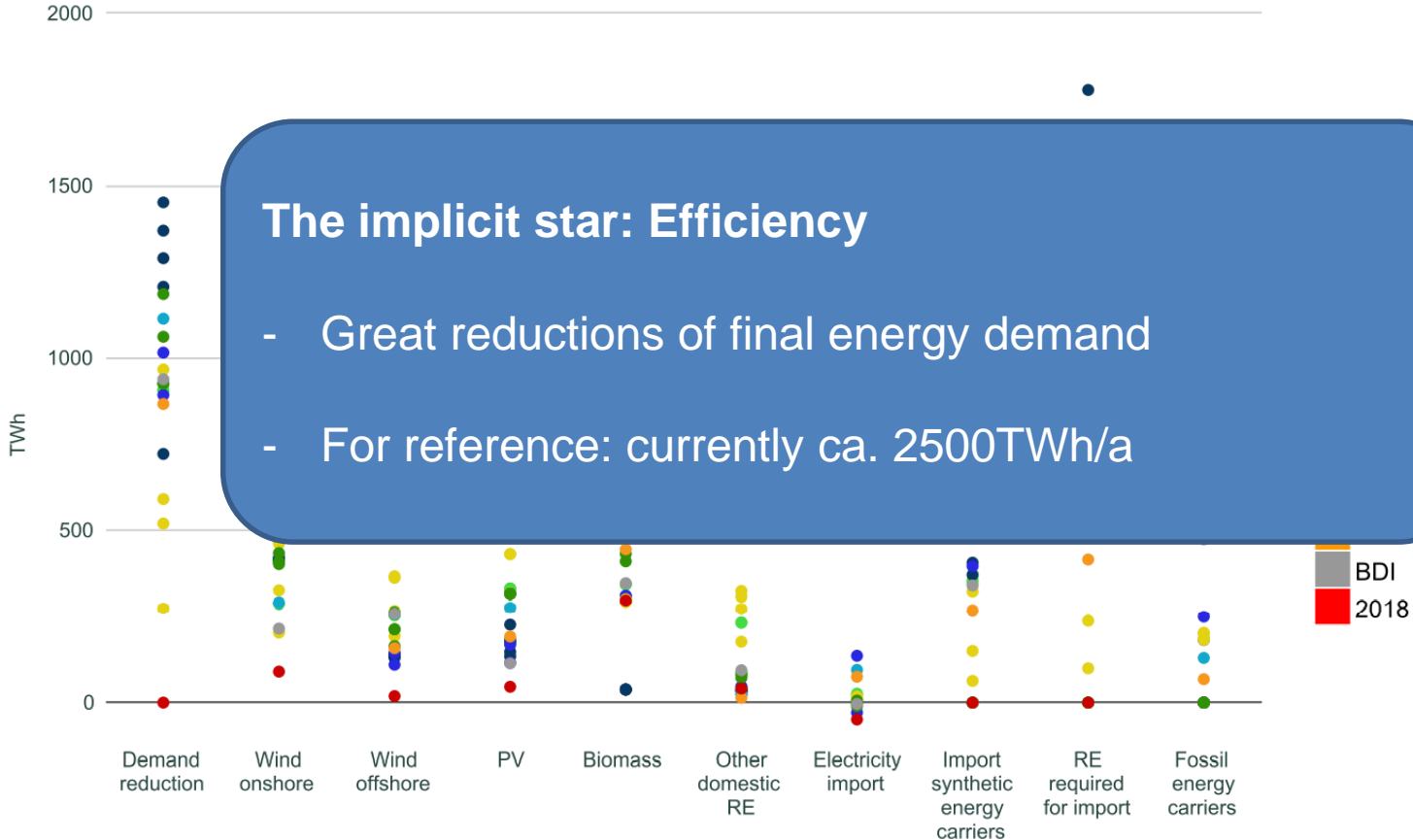
Demand reduction in final energy

All the rest in primary energy

Role of strategies for climate neutrality

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Note:
Demand reduction in final energy
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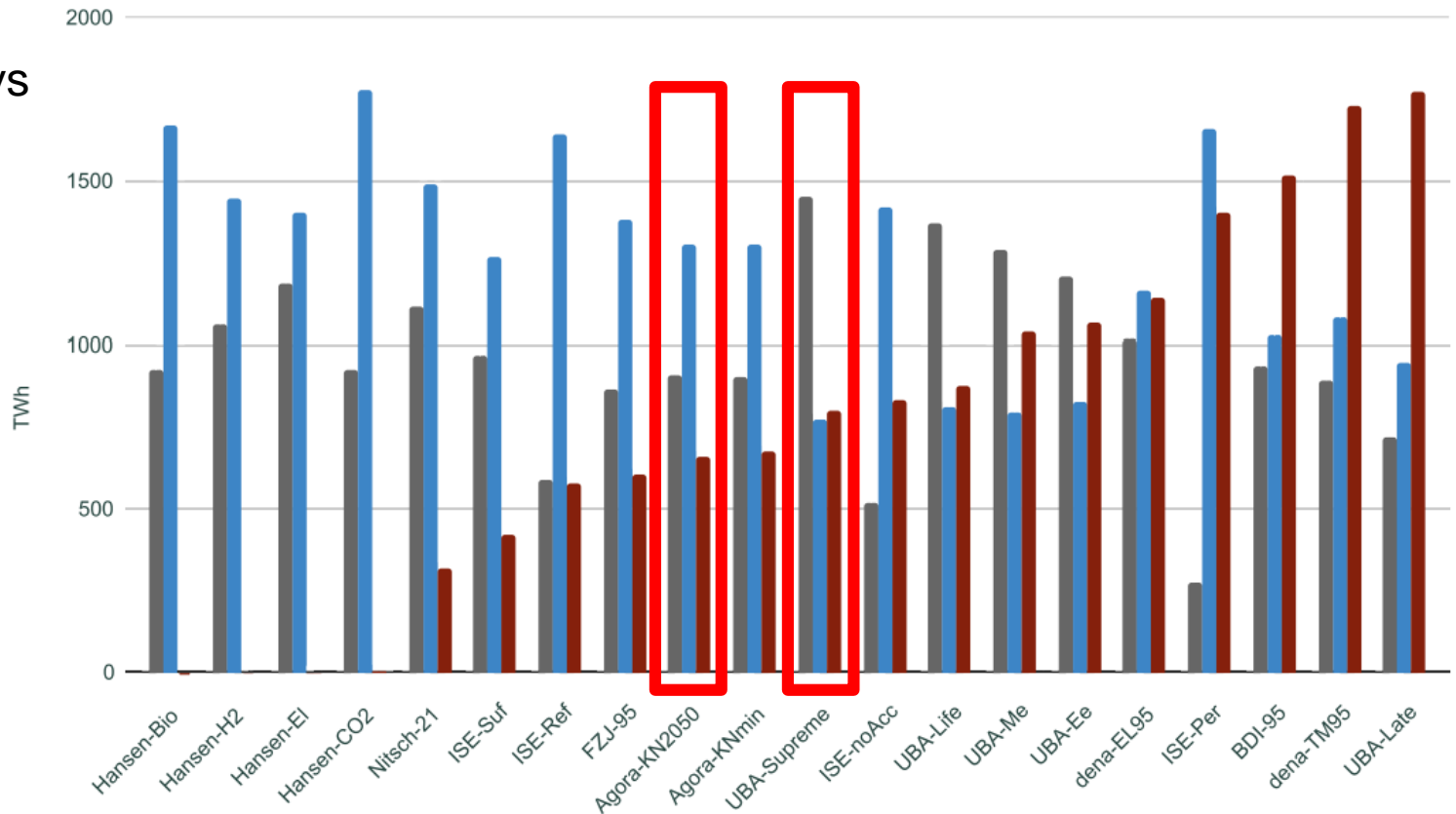
Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

Interdependencies

■ Reduction of final energy demand ■ Domestic energy ■ Renewable energy required for import

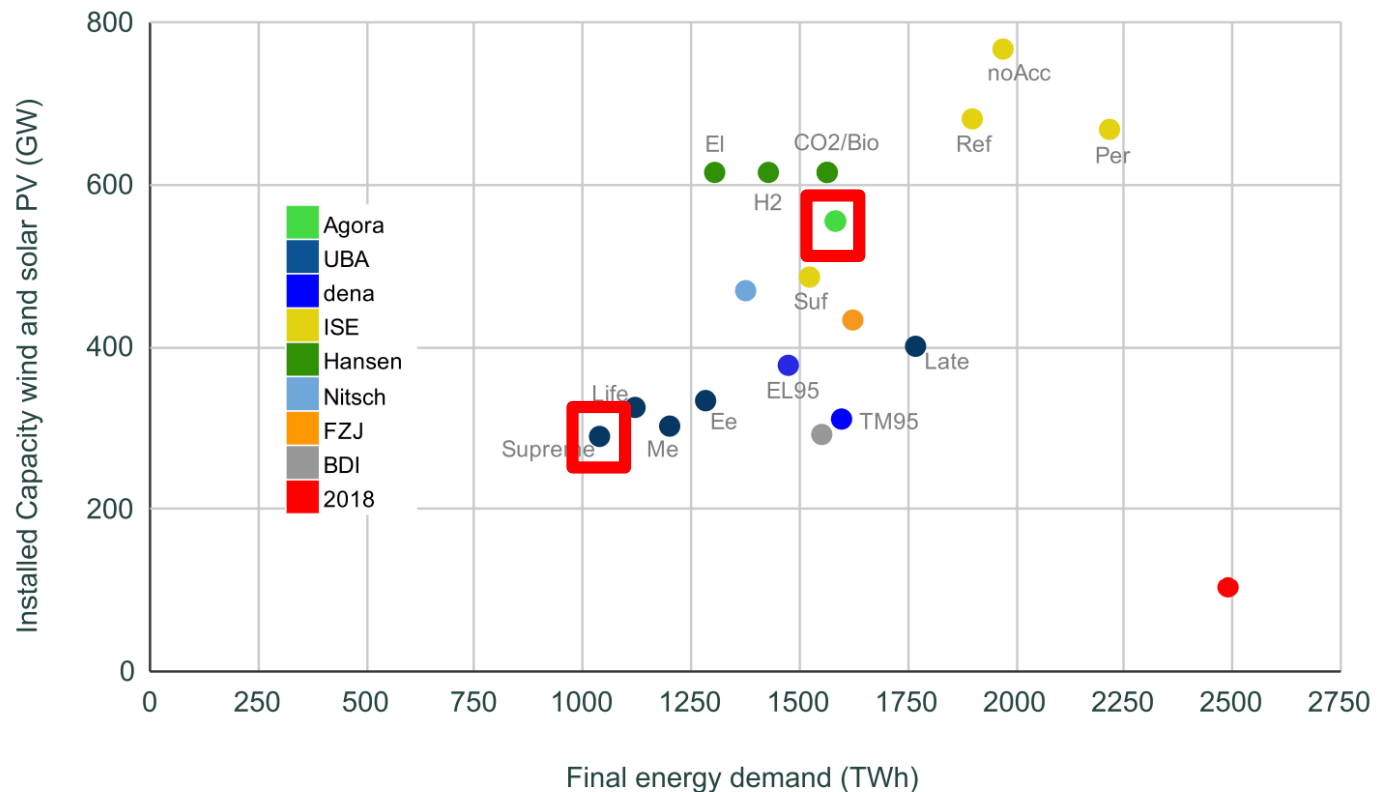
Consistency vs Efficiency?



Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

Interdependencies: Consistency vs Efficiency?



Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

How about sufficiency?

Table 5
Indicators for changes of energy service demand in 2050 .

	UBA-Supreme	Agora-KN2050	reference (year)
billion person-km	958	1200	1200 (2016)
share car use in %	51	54	78 (2016)
billion ton-km	739	900	660 (2016)
avg. living space m ² /person	41	52	45 (2018)
material consumption t/person*a	5.7	not provided	16.8 (2010)

Reduced demands!
in person or goods
mobility, nor in living
area

No reduction!
in person or goods
mobility, nor in living
area

Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

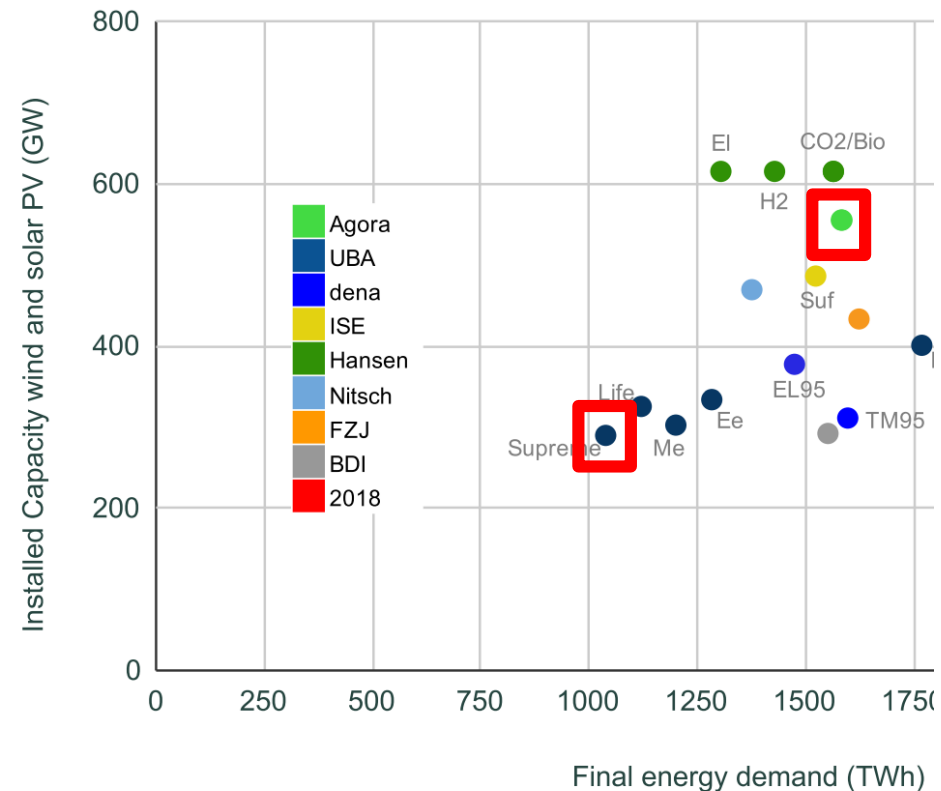
Interdependencies: Consistency vs Efficiency?

Attention, mere rough estimation

Paramount for sufficiency impact:

→ 30% smaller final energy demand

→ 30% required installed capacity (link to critical materials, circular economy)



Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

Interdependencies: Consistency vs Efficiency?

Attention, mere rough estimation

Paramount for sufficiency impact:

- 30% smaller final energy demand
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Which are the main sectors?

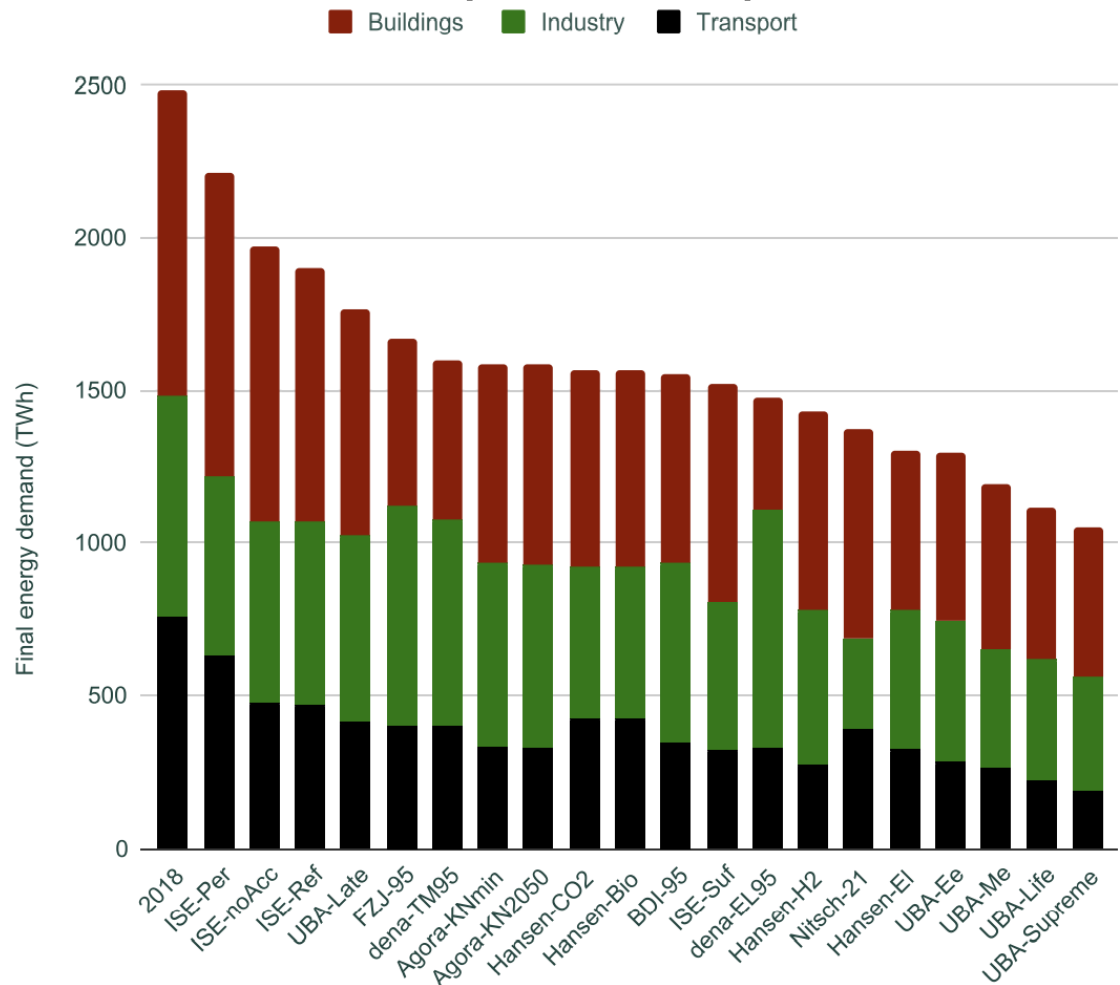
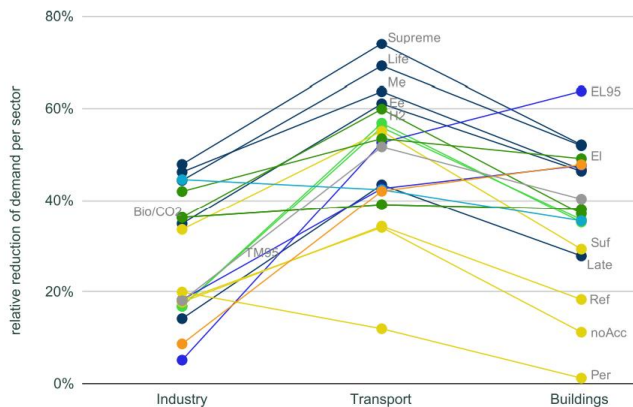
What kind of sufficiency measures are meaningful?

Role of strategies for climate neutrality

Meta-analysis: energy scenarios in GER (since 2018)

Reductions by sector

Industry → 20 - 40%
 Transport → 60 - 80%
 Buildings → 35 - 50%



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Classification of Sufficiency strategies

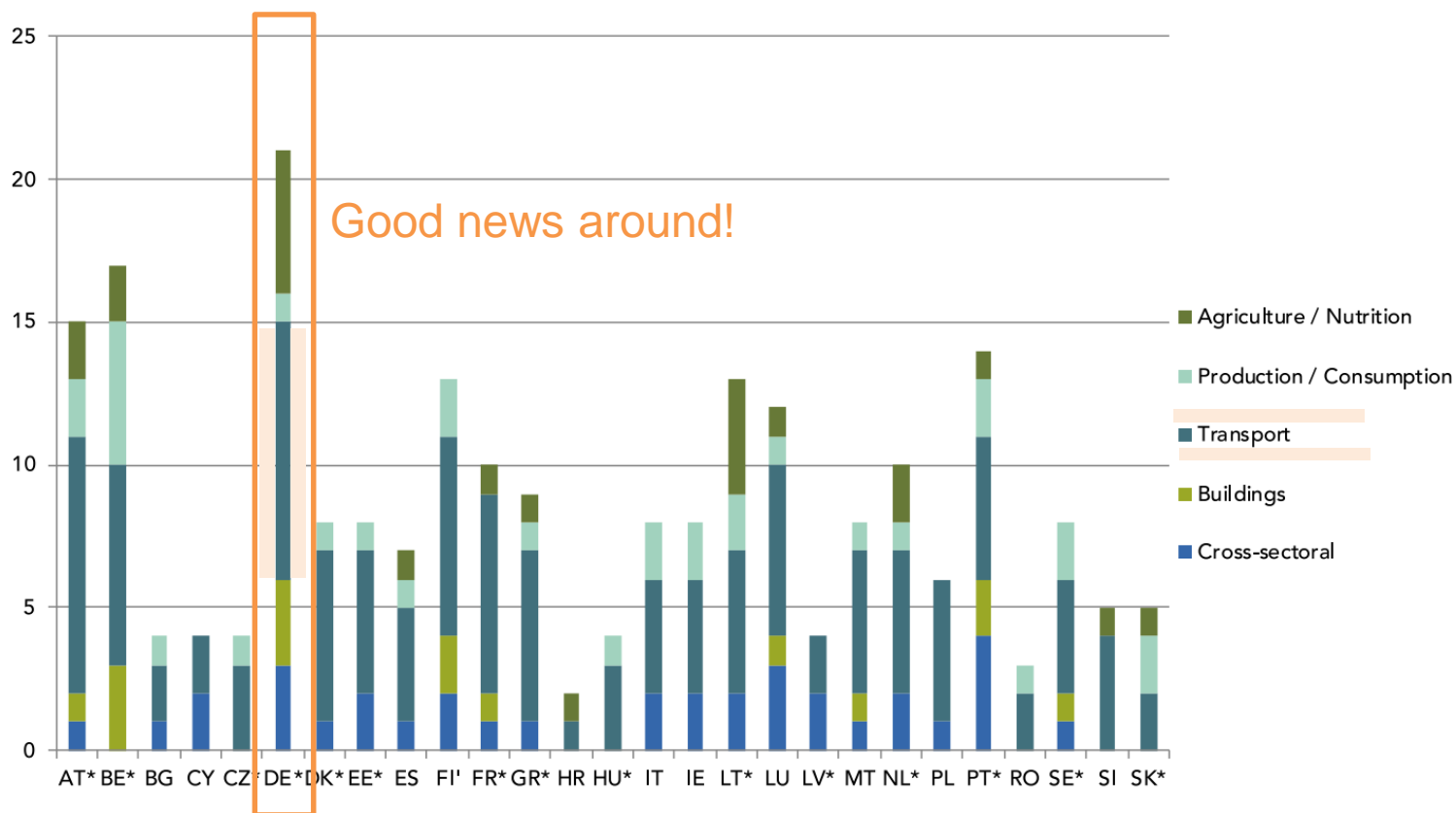
Types

- a) **Reduction:** reducing services provided, e.g. less living area per capita, less Pkm
- b) **Substitution:** replacing one service by another less intensive one, e.g. private mobility by public transport, ICEs by BEVs → close to efficiency!
- c) **General:** strategies addressing reduction of GHG emissions in general (e.g. Carbon taxes) without aiming at one particular strategy/way to achieve them

Classification of Sufficiency strategies

Uses in different sectors (EU)

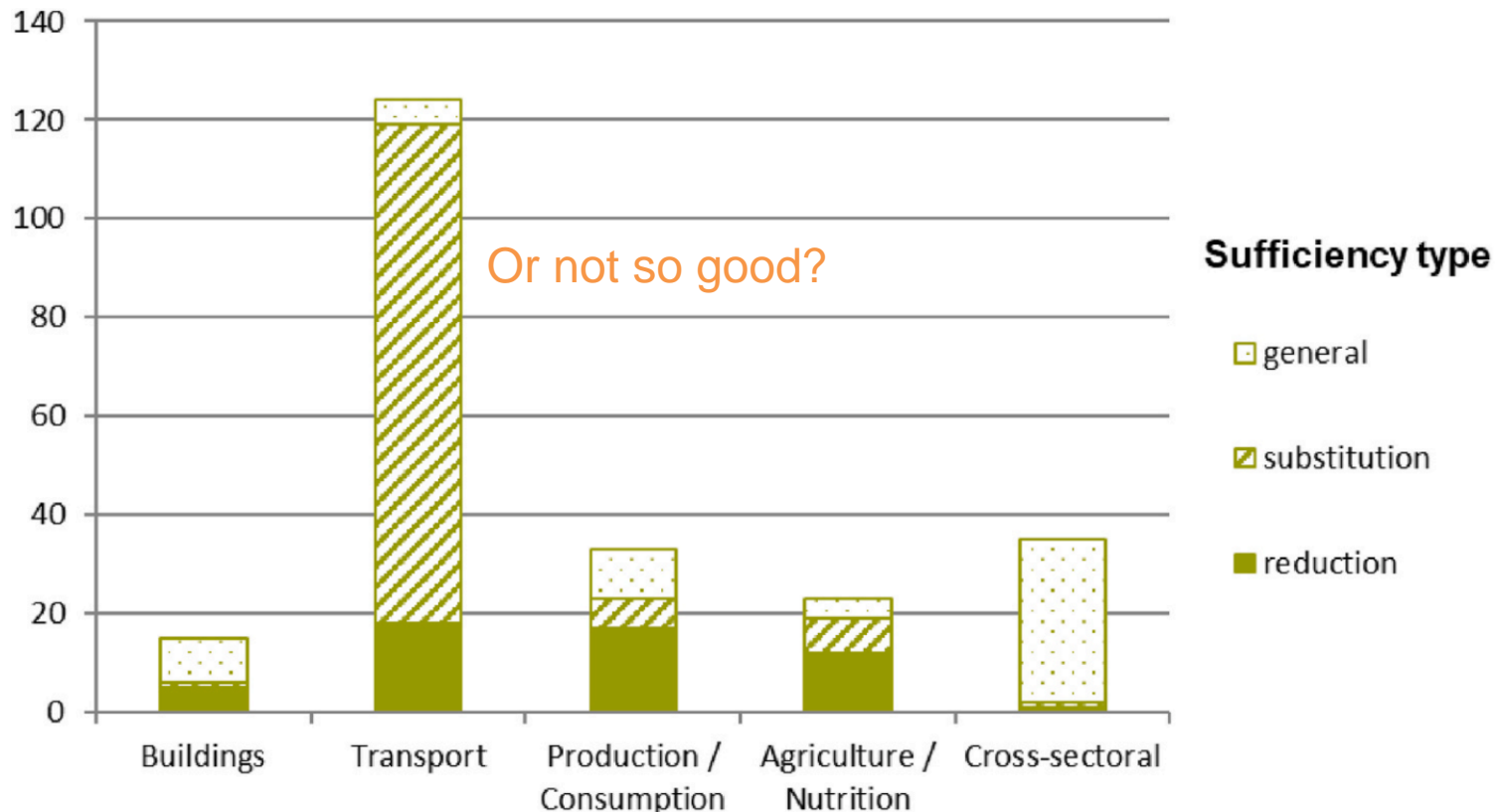
Number of sufficiency measures by country (EU) and sector



Classification of Sufficiency strategies

Uses in different sectors (EU)

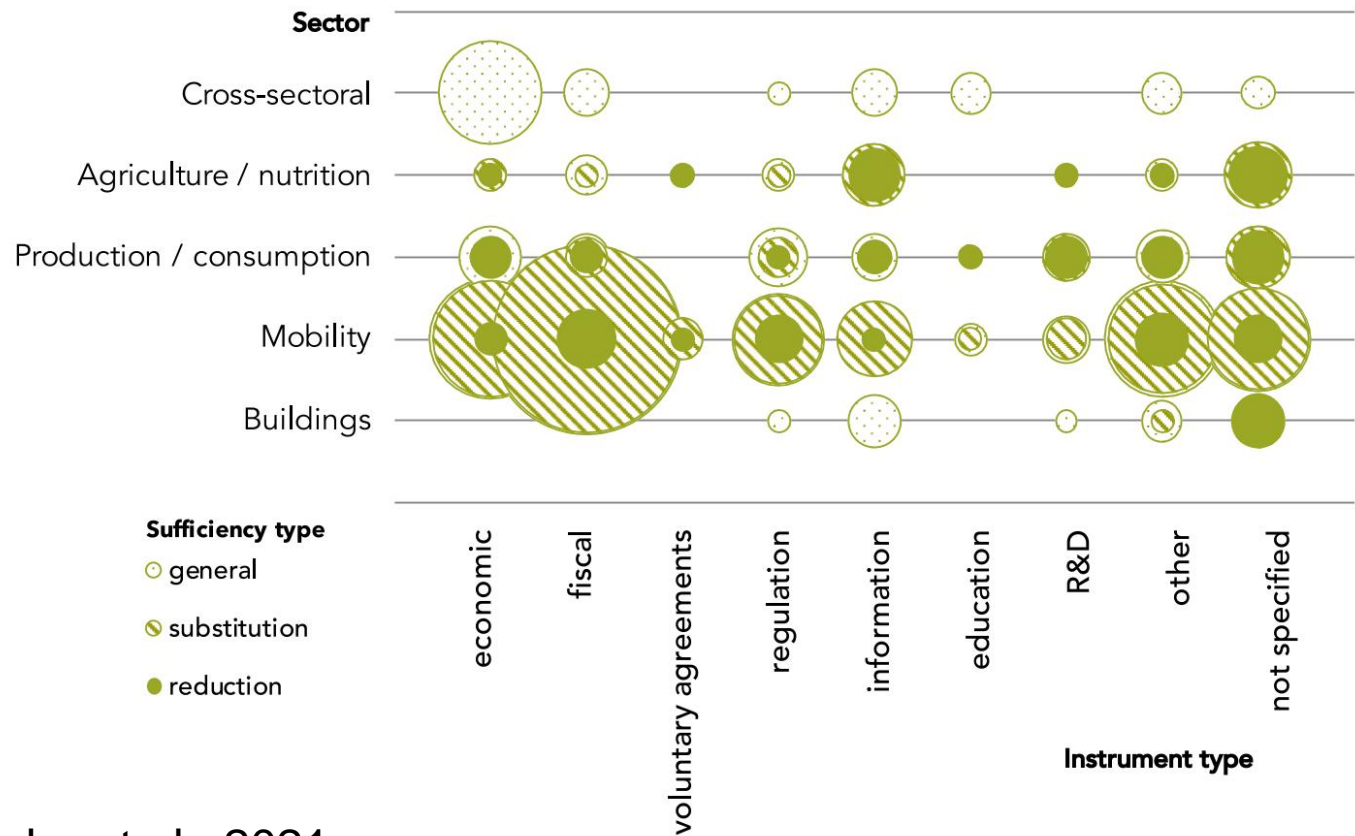
Number of sufficiency measures by sector and type (total 230 measures found)



Classification of Sufficiency strategies

Uses in different sectors (EU)

Number of sufficiency measures by sector, type and policy instrument



Source: Zell-Ziegler et al., 2021

References

Wiese et al., 2022. *Strategies for climate neutrality. Lessons from a meta-analysis of German energy scenarios.* Renewable and Sustainable Energy Transition 2 (2022) 100015 <https://doi.org/10.1016/j.rset.2021.100015>

Zell-Ziegler et al., 2021. *Enough? The role of sufficiency in European energy and climate plans.* Energy Policy, Volume 157, 2021, ISSN 0301-4215, <https://doi.org/10.1016/j.enpol.2021.112483> .

“Renewables don't lose an ecological problem,
only transform them into another physical,
spatial, temporal or systemic dimension”

Niko Paech

2012. Auf dem Weg in die Postwachstumsökonomie. In: Orientierungen zur

Wirtschafts und Gesellschaftspolitik. Nr. 134, pp. 61-67

<http://www.postwachstumsoekonomie.de/wp-content/uploads/Paech-2012-Orientierungen-134.pdf>