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Spatial Justice & Participation in the Energy Transition

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TU Delft Delft University of Technology

TU/e Eindhoven University of Technology

UNIVERSITY OF TWENTE.

WAGENINGEN UNIVERSITY & RESEARCH

Introduction of presenters

Eveline van Leeuwen
Professor Urban economics,
Wageningen University
Scientific Director AMS Institute

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Environmental Policy
Wageningen University
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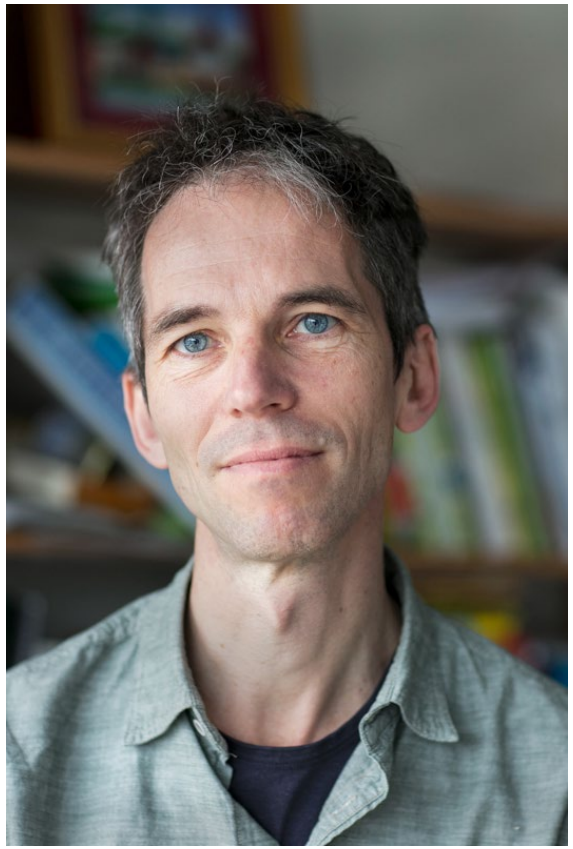

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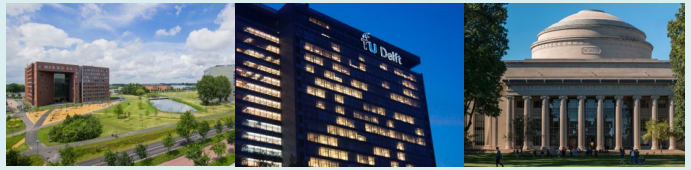
AMS Institute model

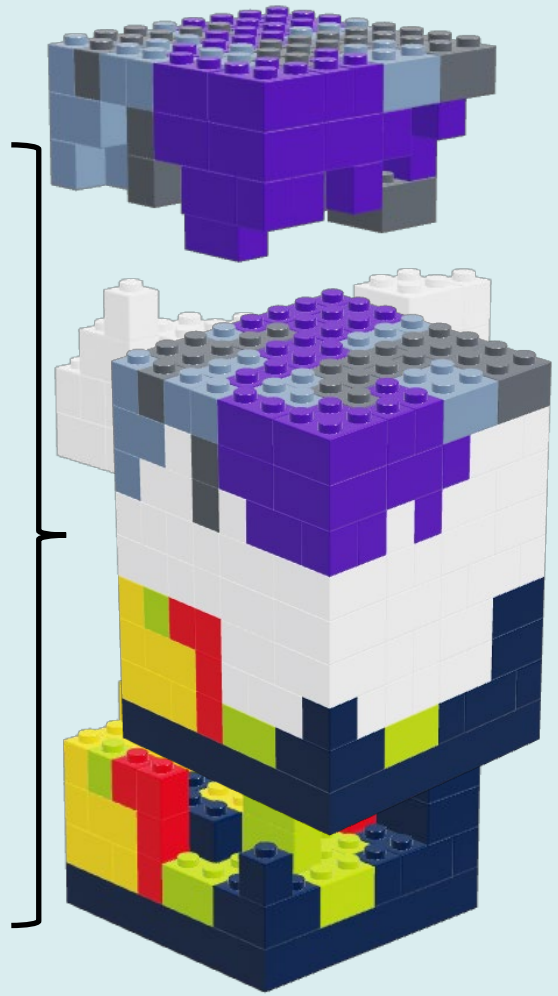
Integral challenges, city framework

Complex urban challenges

World class academic excellence



Discipline based, academic framework



AMS
AMSTERDAM INSTITUTE FOR
ADVANCED METROPOLITAN SOLUTIONS

Lessons AMS Institute

1. True partnership
2. Build on talent
3. The power of permeability
4. Place matters in many ways
5. Solutions that matter
6. The entrepreneurial state of mind
7. Learning by doing

Quotes PhDs

“I found transdisciplinary research to be a highly important, engaging, and holistic approach that integrates diverse perspectives to address complex challenges.”

“Social aspects such as collaboration, collective action, equity, and public acceptance are key for an inclusive and effective energy transition

Goals for today's session

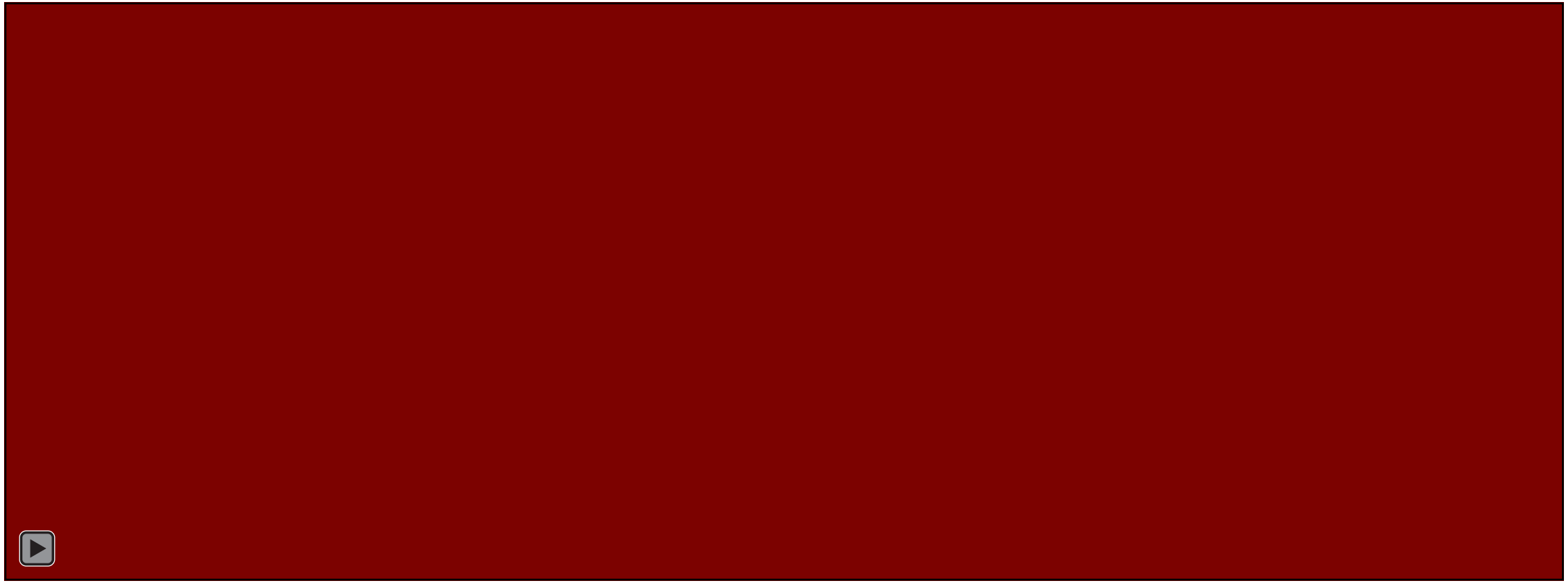
- Get acquainted with concepts of “spatial energy justice” and “participation” and their analytical value for research into the energy transition

- Apply and assess their value for your own energy research

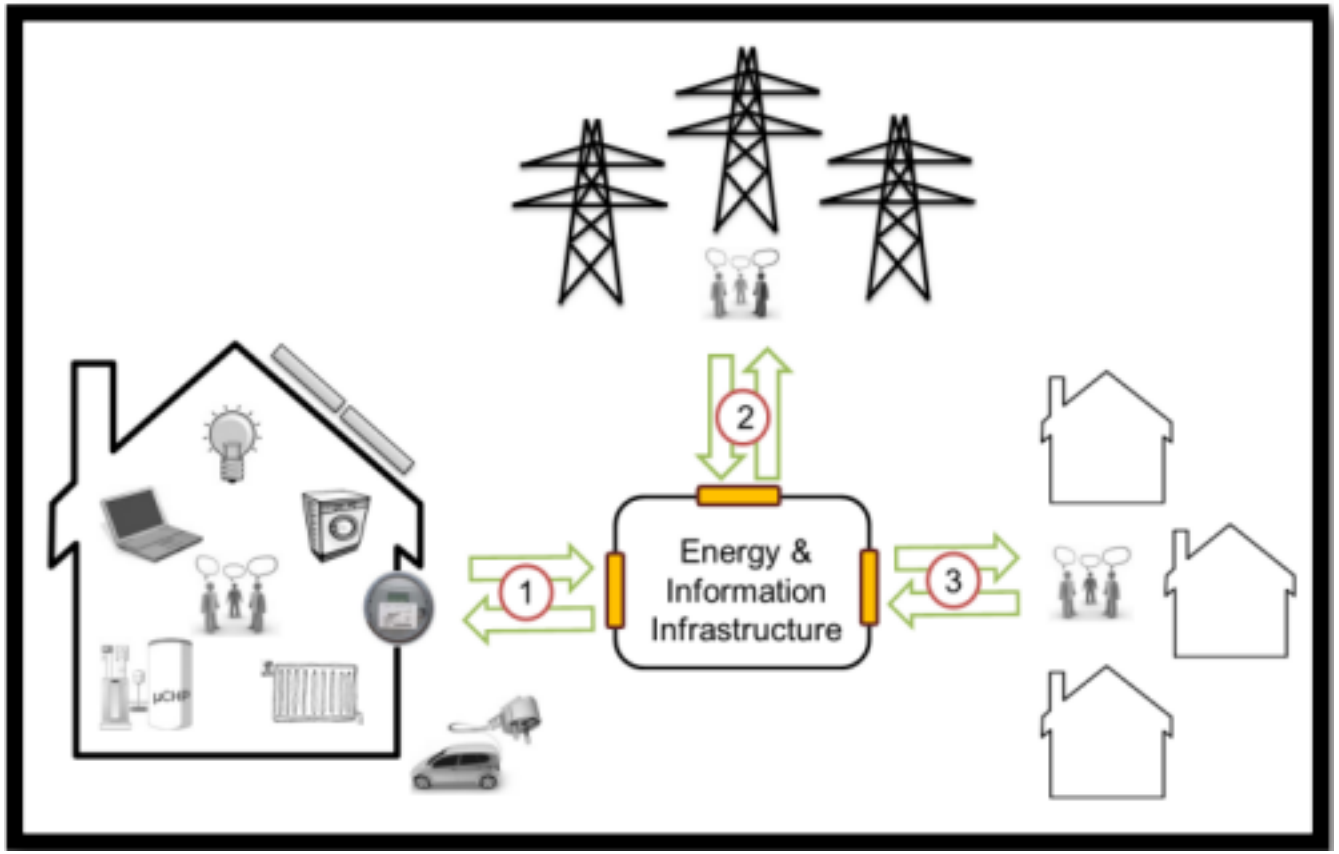
Programme

- The energy transition from home to system level
- Issues & Concepts of Spatial Justice and Participation
- Projects AMS-Institute and JustRES (WU)
- Applications to your projects

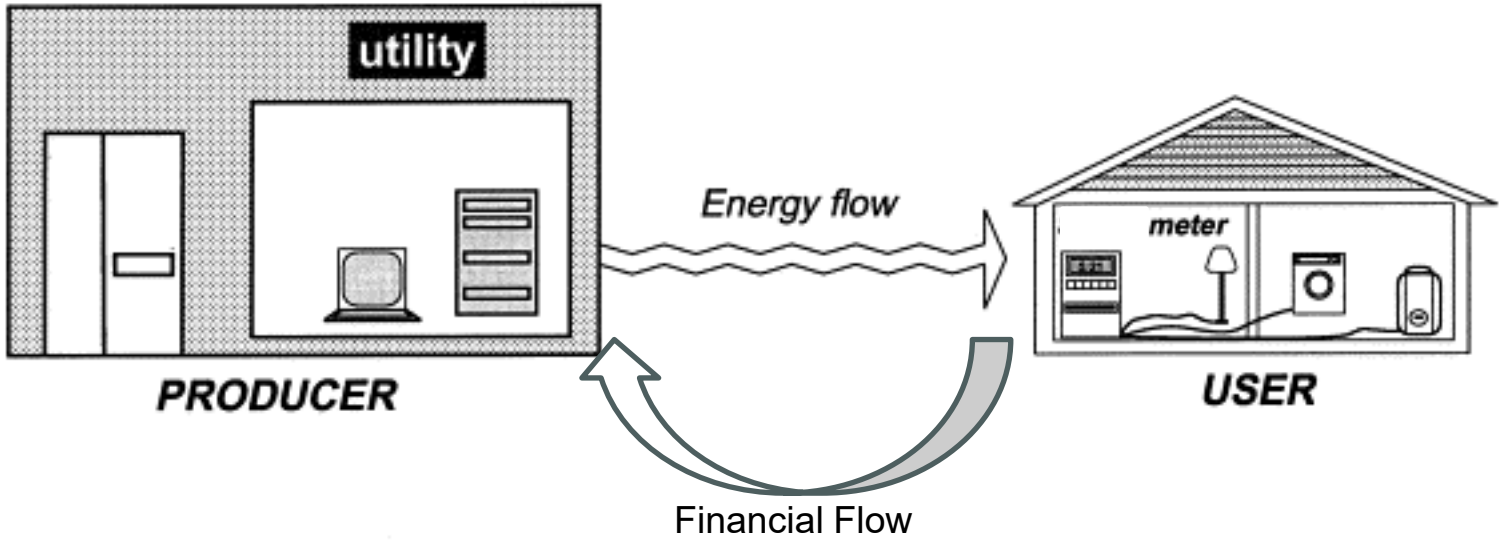
The Energy Transition from Home to System Level



Energy systems viewed from the home upwards



Utility – User interaction (until 2000 and after)

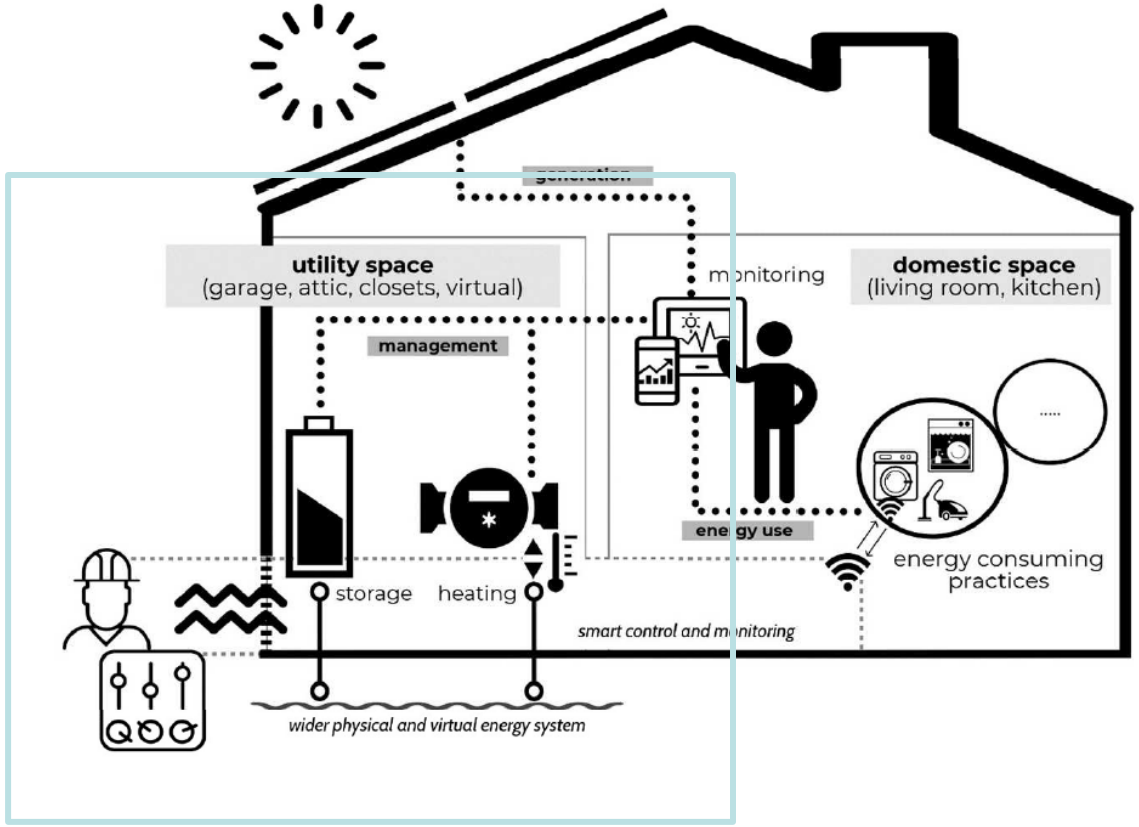


Marvin, Graham, Guy (1999) **Cities, regions and privatised utilities** Progress in Planning, Volume 51, Issue 2, 1999, 91–165

http://dx.doi.org/10.1016/S0305-9006(98)00028-2

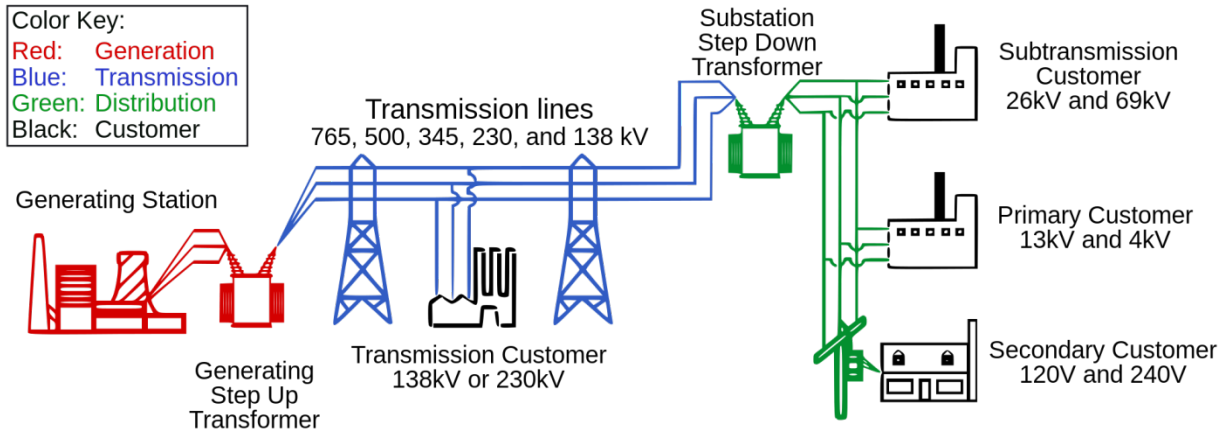

NOW, I'M NOT POINTING ANY FINGERS HERE, BUT I WAS TALKING TO YOUR TOASTER YESTERDAY AND HE WAS WONDERING WHY YOU HAD TO TOAST A BAGEL DURING PEAK HOURS. AND DON'T GET ME STARTED ON WHAT YOUR CELLPHONE CHARGER HAS BEEN SAYING...
I HATE THESE NEW SMART METERS.

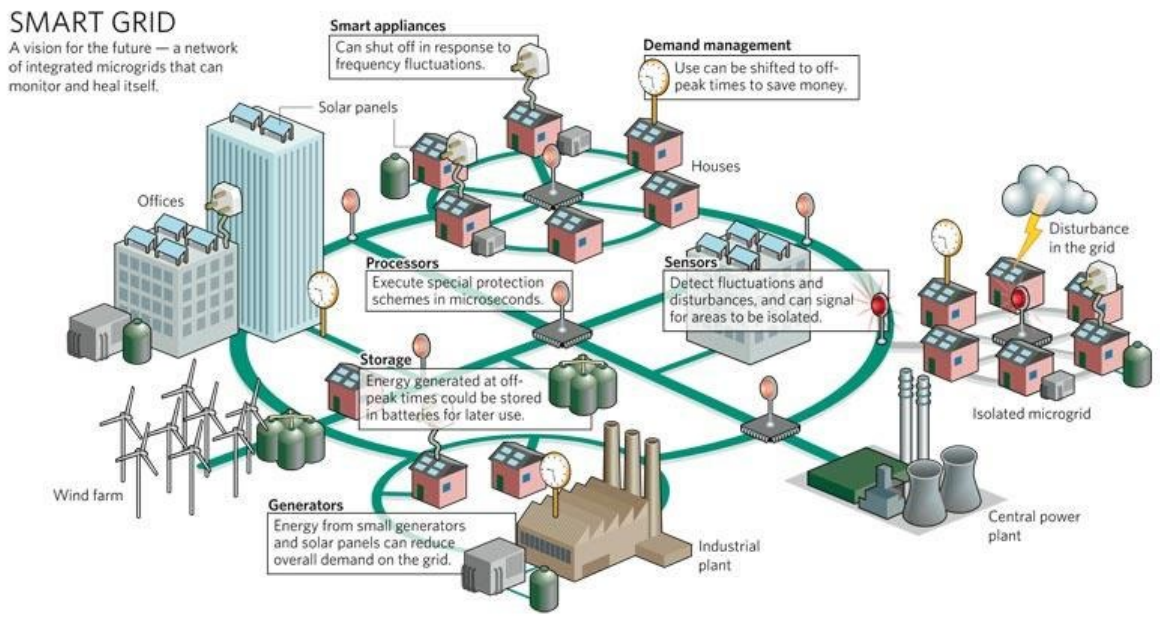
Utility – user interaction 2025



Smale, R., Spaargaren, G., & van Vliet, B. (2019). Householders co-managing energy systems: space for collaboration? Building Research & Information, 47(5), 585–597. http://doi.org/10.1080/09613218.2019.1540548

A Transition in Generation, Transmission, Distribution





Societal costs of grid connection

PhD research of Chuma Ebere

Interrelations in the electricity grid and GSV

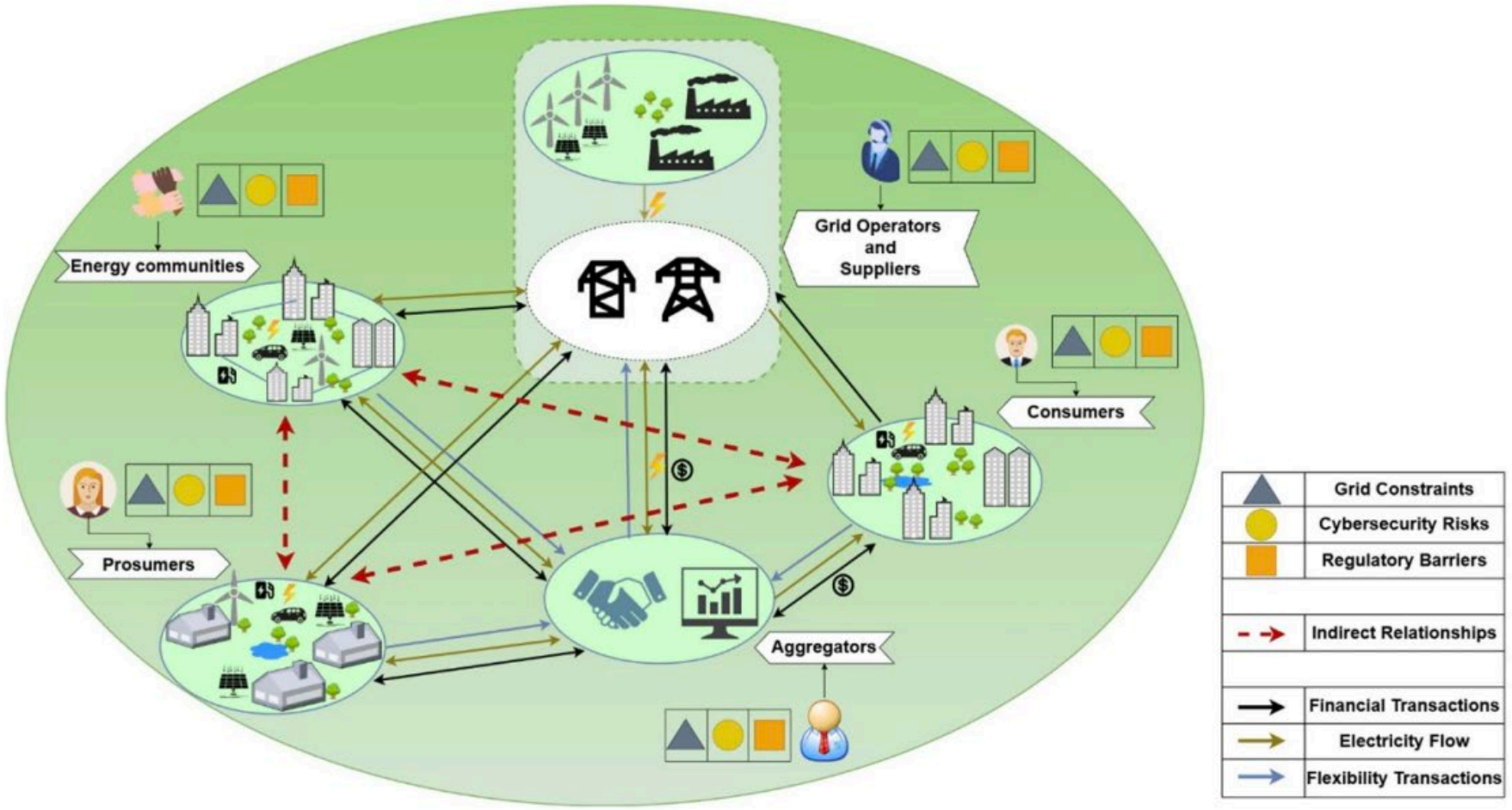


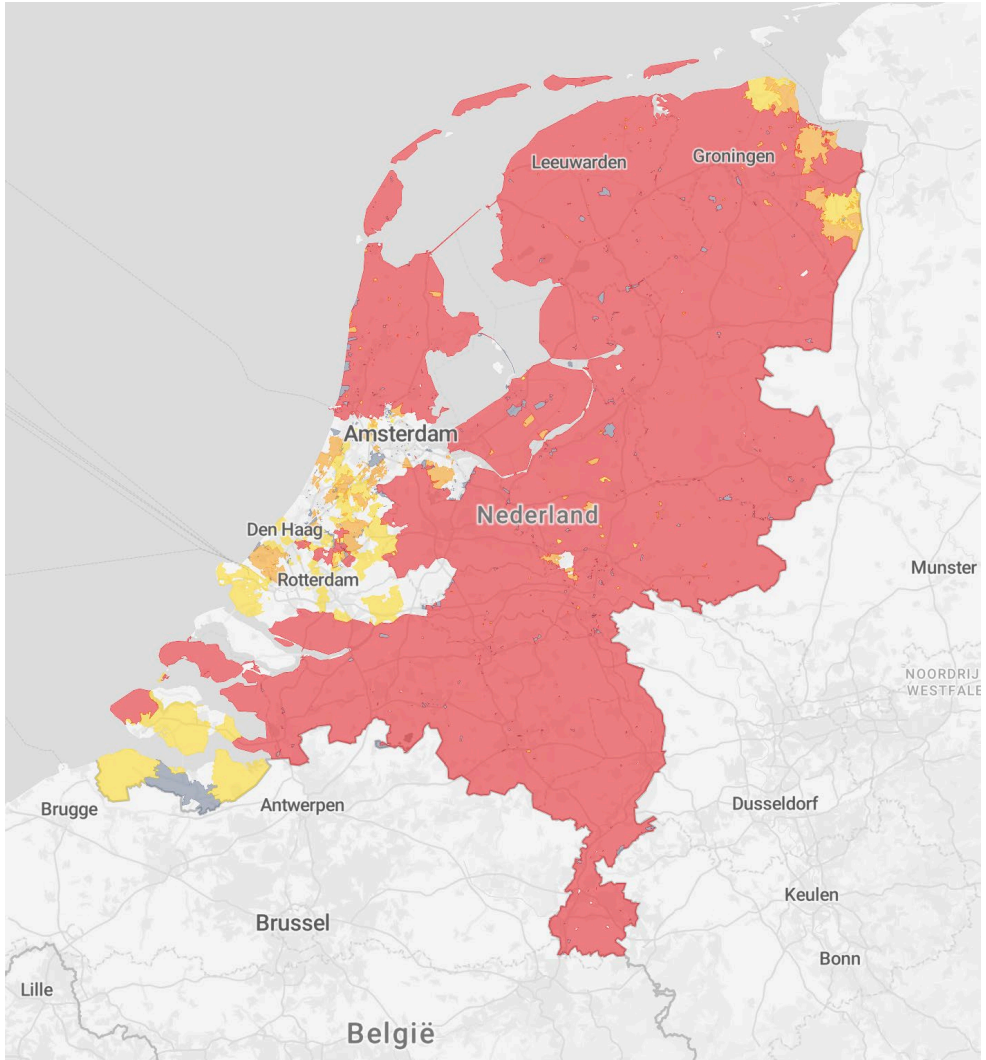
Figure 4. Stakeholders' (in)direct interrelations in the electricity grid and GSV factors.

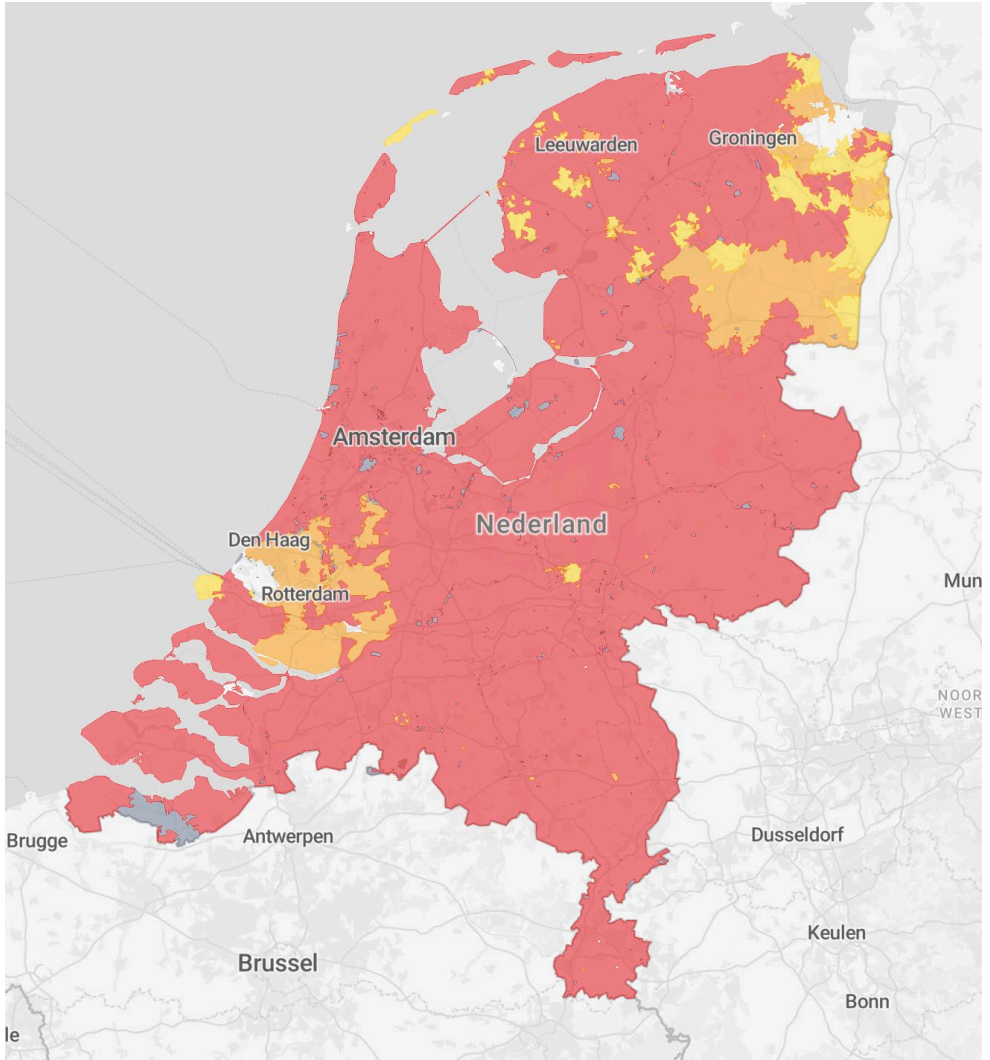
Grid-Society Vulnerability

‘the likelihood of an unequal distribution of costs and benefits vis-`a-vis grid services among stakeholders due to the technical, economic, spatial, and legal challenges that arise with the increasing digitalisation and decentralisation of energy systems.’

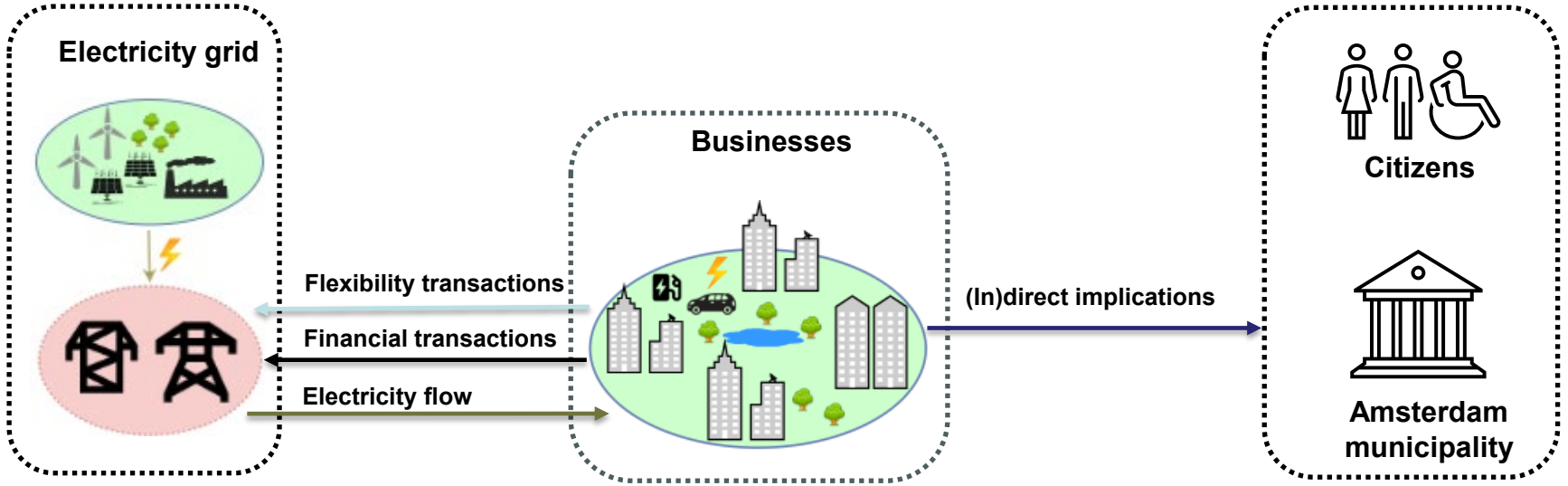
Ebere, C., Vega, S. M. H., van Leeuwen, E., & Mashhoodi, B. (2025). Electricity grid and societal vulnerability interconnection: stakeholder implications and integrated solutions in Europe. *Environmental Research Letters*, *20* (10), 103007.

Grid capacity supply and demand





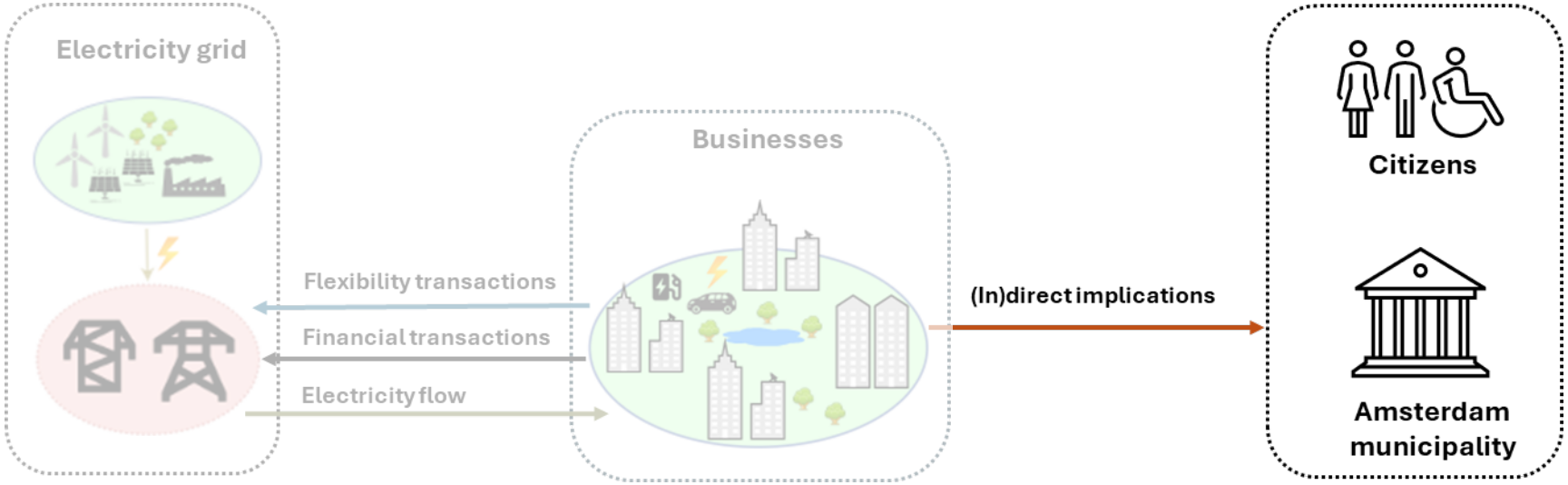
Grid-societal vulnerability interconnections in Amsterdam's business ecosystem



Businesses* - grootverbruikaansluiting, also include new housing projects and social enterprises.

Ebere et al. 2025, Electricity grid and societal vulnerability interconnection:
stakeholder implications and integrated solutions in Europe

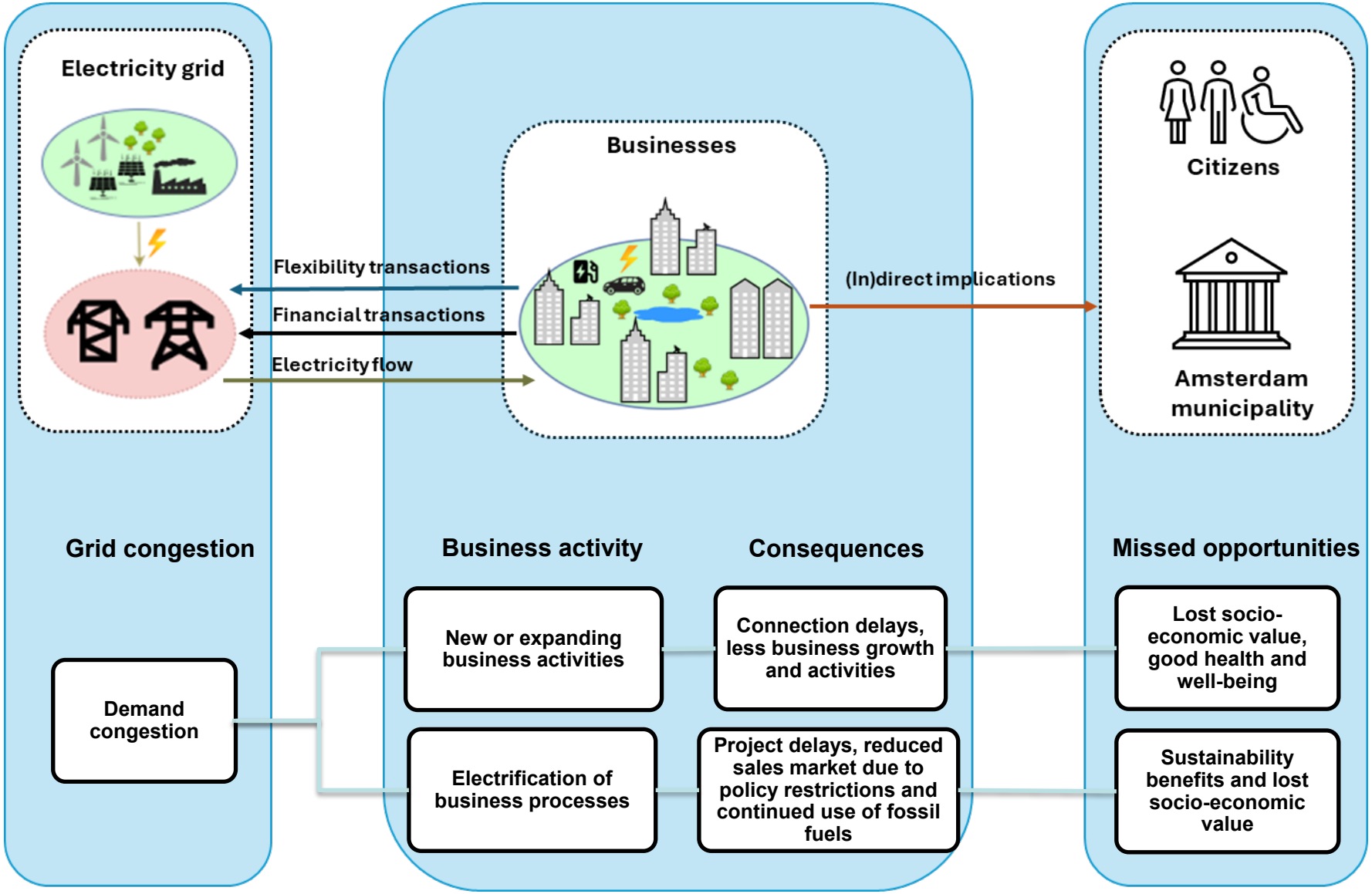
Societal cost of grid congestion



"Maatschappelijke kostprijs van netcongestie" Eindrapport, Ministerie van Economische Zaken en Klimaat, 29 April 2024

- Quantifies the societal cost of grid congestion when one MWh of electricity cannot be delivered due to congestion – National scale.

Institutional innovation for collaborative grid capacity flexibility in Amsterdam's business ecosystem



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Justice and participation

ISSUES AND CONCEPTS

Energy Justice?

Investments in infrastructure for Renewable Energy affect social justice:

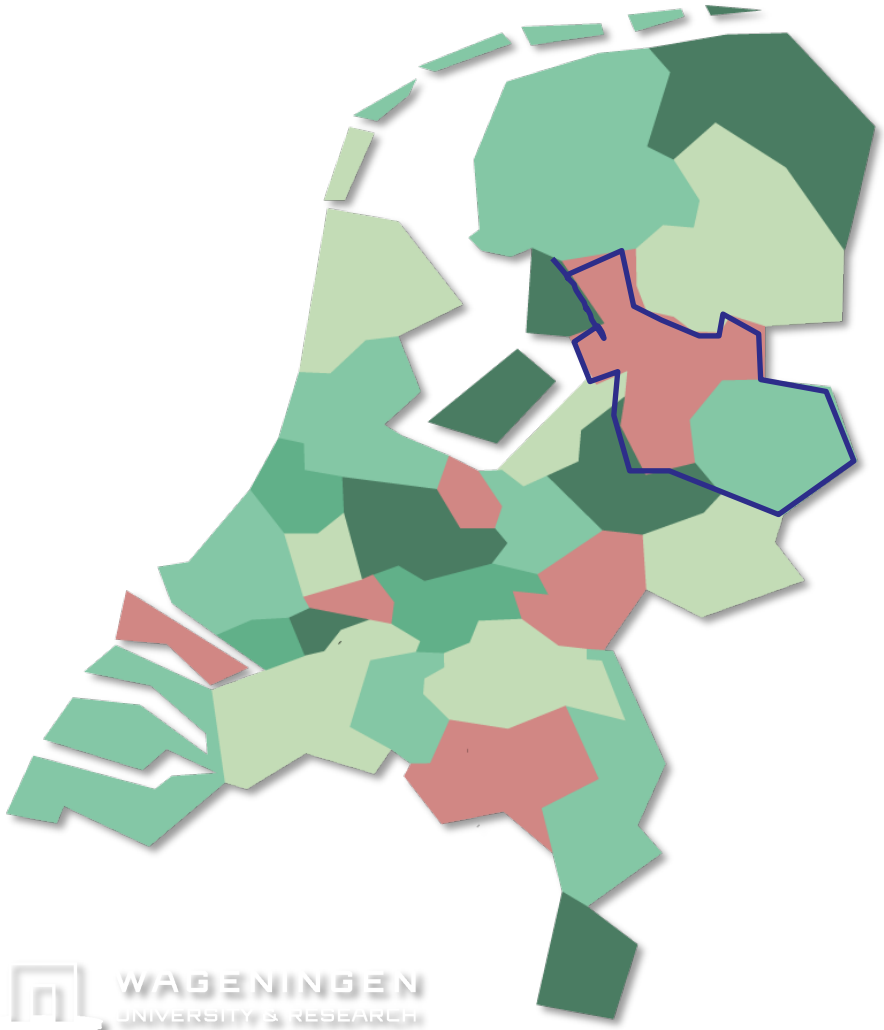
Benefits and burdens are **not equally *distributed*** amongst urban/rural; socio-economic demografics, farmers/urban residents

Procedures may include or exclude, may be transparent; decision makers held accountable

Various societal groups and their stakes may be ***recognised*** or not.

Energy Transition also leads to substantial ***spatial*** claims for energy production, storage and distribution, including publicly valued landscapes.

Regional energy transition in the Netherlands



- 2019 Climate Agreement: 2050 complete transition to renewable energy
- 35 TWh renewables on land in 2030

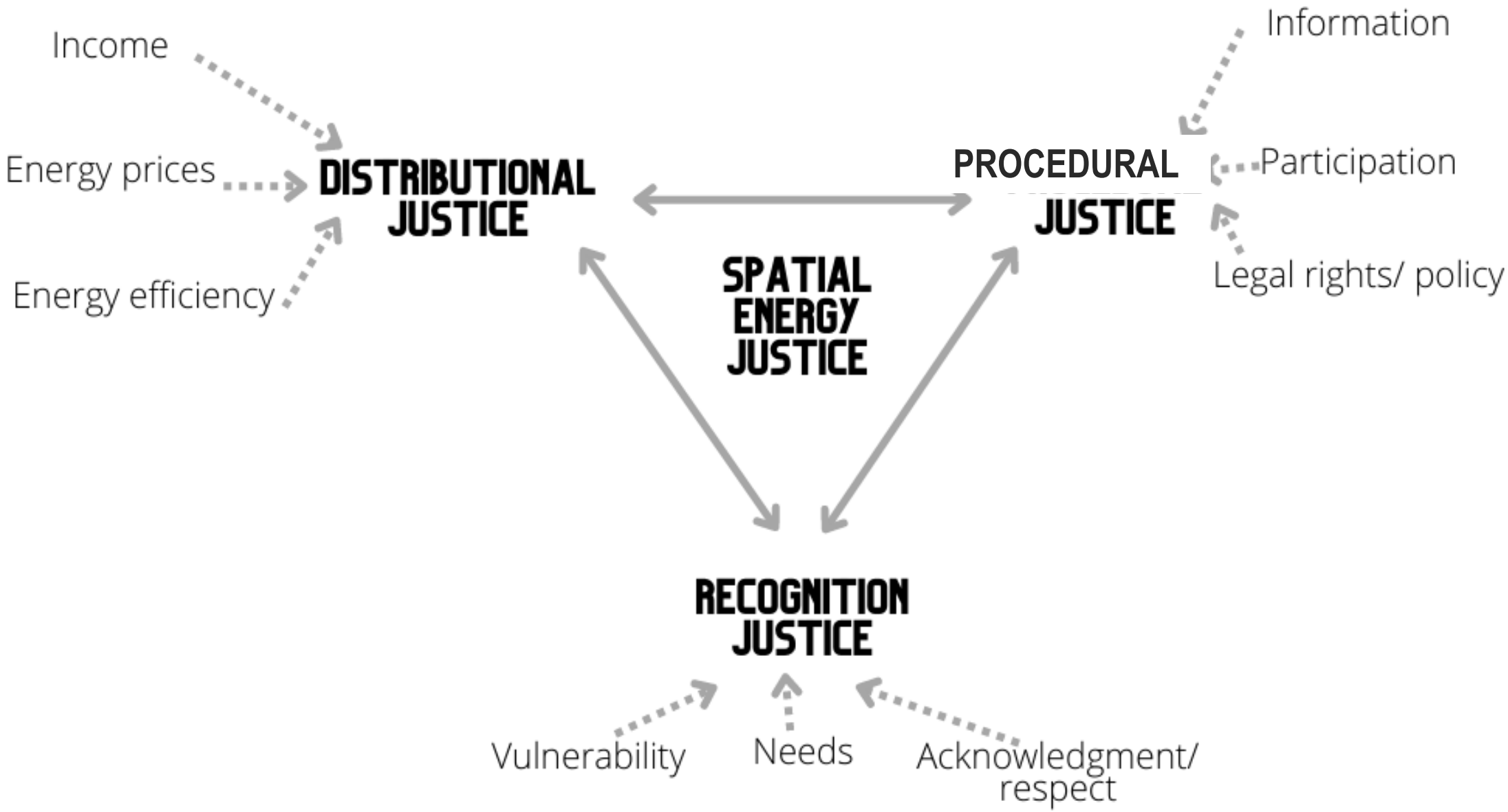
- 30 Energy regions in the Netherlands have to plan: how, where?

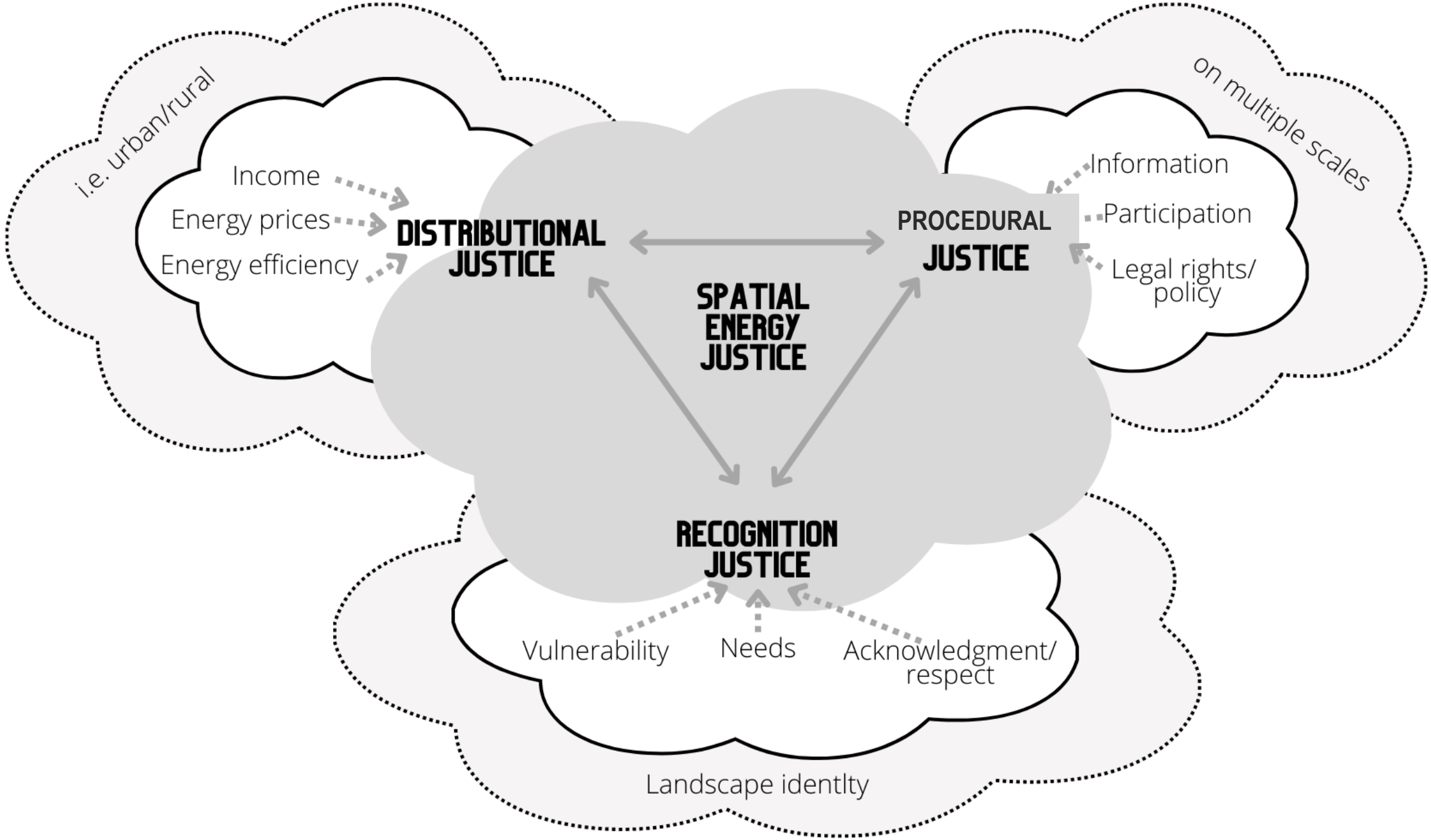
- This has to be done with support of local communities, citizens, waterboards, grid operators

Spatializing Energy Justice

- The concept of ‘spatial justice’ requires both the **description and evaluation of spatial inequalities** as well as an examination of the **geographical processes through which these injustices are (re)produced.**

- **Spatial justice** as such is **not a substitute** or alternative to social, economic, or other forms of justice but **rather a way of looking at justice from a critical spatial perspective** (Soja, 2009)


Income
Energy prices
Energy efficiency
DISTRIBUTIONAL JUSTICE
Information
PROCEDURAL JUSTICE
Participation
Legal rights/ policy
SPATIAL ENERGY JUSTICE
RECOGNITION JUSTICE
Vulnerability
Needs
Acknowledgment/ respect


i.e. urban/rural
Income
Energy prices
Energy efficiency
DISTRIBUTIONAL JUSTICE
on multiple scales
Information
Participation
Legal rights/ policy
PROCEDURAL JUSTICE
SPATIAL ENERGY JUSTICE
RECOGNITION JUSTICE
Vulnerability
Needs
Acknowledgment/ respect
Landscape identlty

Energy justice spatialized

- Distributional: fair distribution of costs and benefits, fair distribution of interventions in space; i.e., between rural and urban
- Procedural: process, transparency, accountability, on a particular scale: neighborhood, city, region, nation
- Recognition: respect, representation, space as a lived experience, recognition of landscape-related identities

What is participation?

- ‘Involvement of citizens and other stakeholders in urban planning and decision making’ (Silver et al 2010).

Why participation?

- **Moral arguments**:

  it's democratic and inclusive

- **Substantive arguments:**

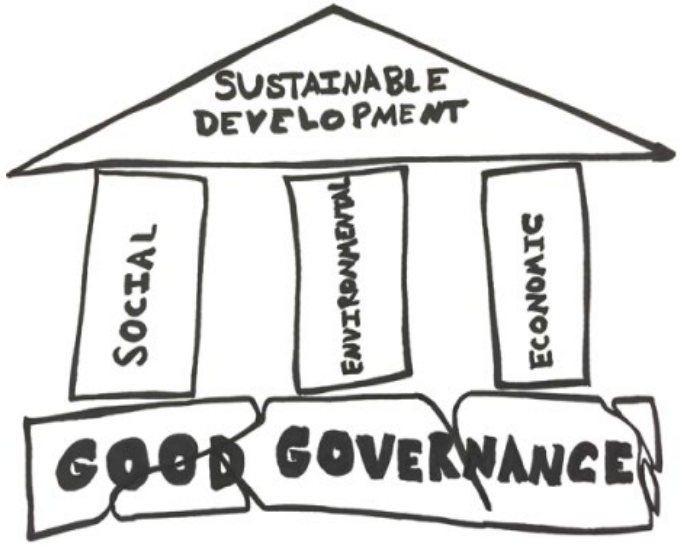
  b*etter quality policy/planning*

- **Instrumental arguments:**

  more support for policy/planning

- **Economic arguments:**

  without is more costly



Claimed Benefits of Participation

- Promote Social Inclusion
  - Decision-making ideally open to all citizens
- Empowerment
  - Recognition and power to often neglected groups
- Redistribution or social justice
  - As a consequence of the participatory process: redistributive outcomes

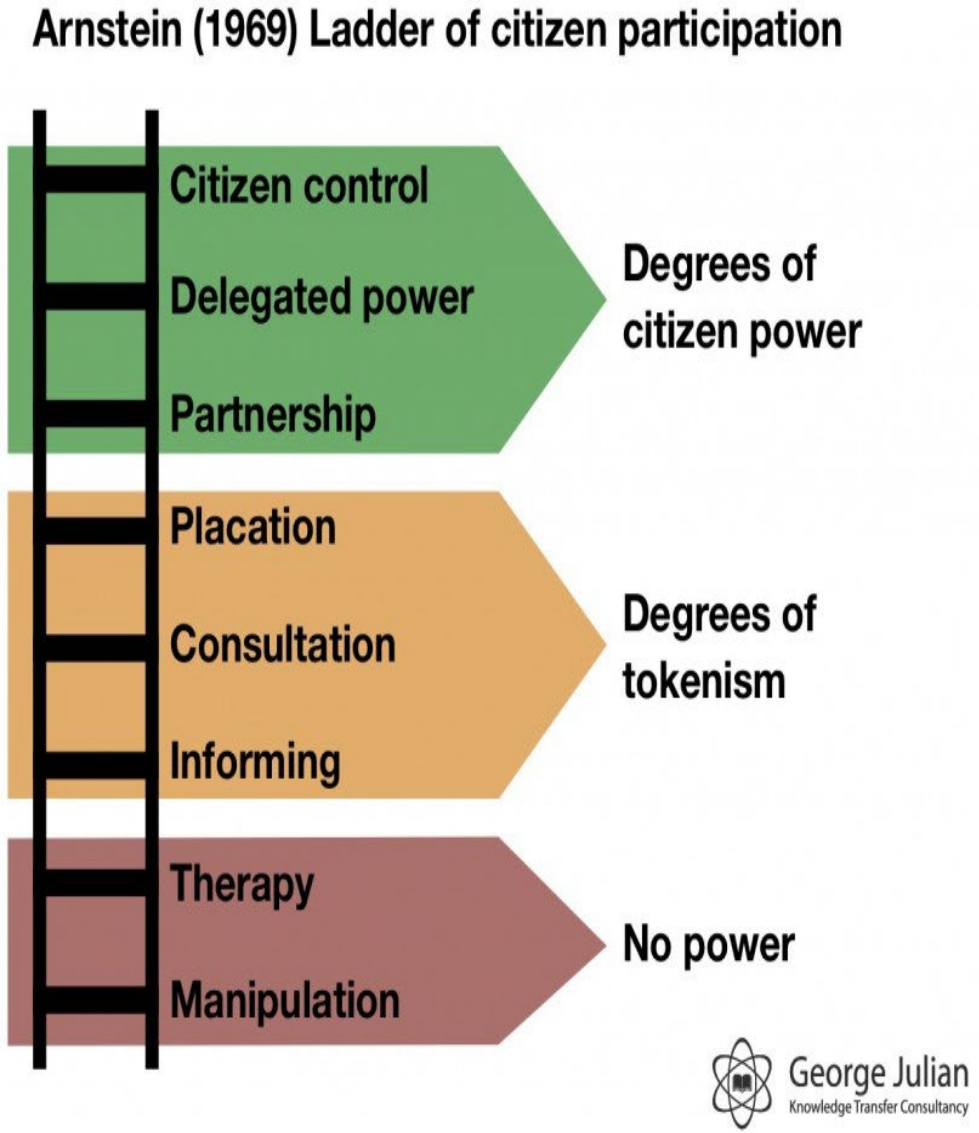
These are **moral, substantive** or **instrumental** arguments?

Participation in stages of policy process

Most literature on participation

- Different conceptions of participation may apply at distinct the policy process.
  - At the **policy initiation stage**, politics and conflict may dominate, as local grassroots groups make demands, or elites propose policies for which they seek legitimacy and compliance;
  - At the **stage of decision making,** when contestations move towards resolution, deliberation, consensus seeking or compromise may be more prominent;
  - At the **implementation stage**, when problem-solving and practical results matter, participation in executing or monitoring a policy may be more-or-less inclusive and transparent.
  - At the **operational stage,** when assets need to be managed and maintained, policies are re-evaluated and adapted

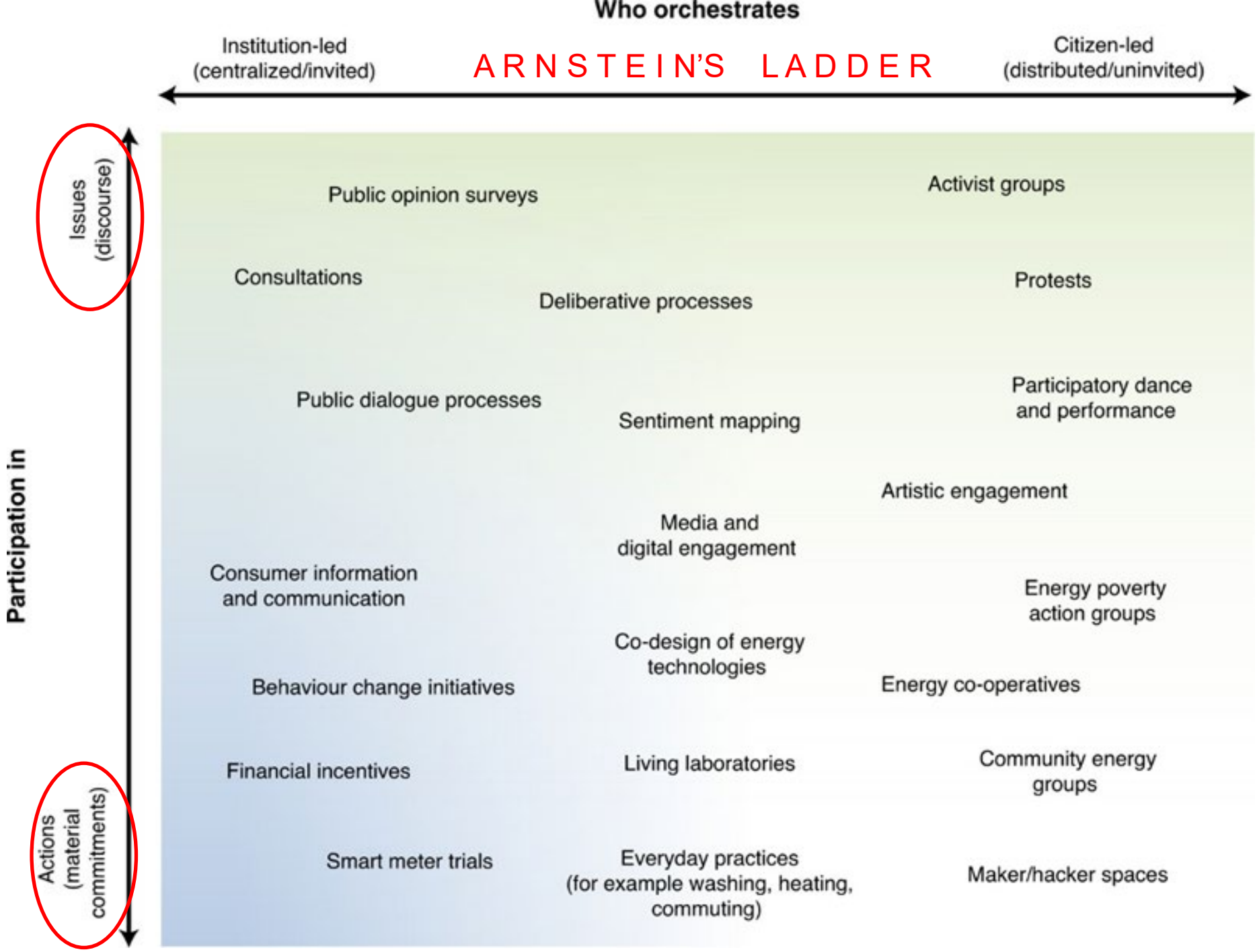
What forms of participation?



"There is a critical difference between going through the empty ritual of participation and having the real power needed to affect the outcome of a process" (Arnstein, 1969: 216)

Participatory innovations…

- **Direct democracy**
  - Consultative and binding referenda
  - Citizen councils
- **Co-development:**
  - Urban/neighbourhood planning scenarios
- **Bottom-up initiatives: "do-democracy" (ProDemos, 2013)**
  - urban agriculture
- **Activism: "right to the city" (Lefebvre, 1968)**
  - guerilla gardening, squatting



Chilvers, J., Bellamy, R., Pallett, H., & Hargreaves, T. (2021). A systemic approach to mapping participation with low-carbon energy transitions. *Nature Energy 2021 6:3*, *6*(3), 250–259. https://doi.org/10.1038/s41560-020-00762-w

Participation in policy, technology on different levels
(Still from our WUR-AMS MOOC “Co-creating Sustainable Cities”

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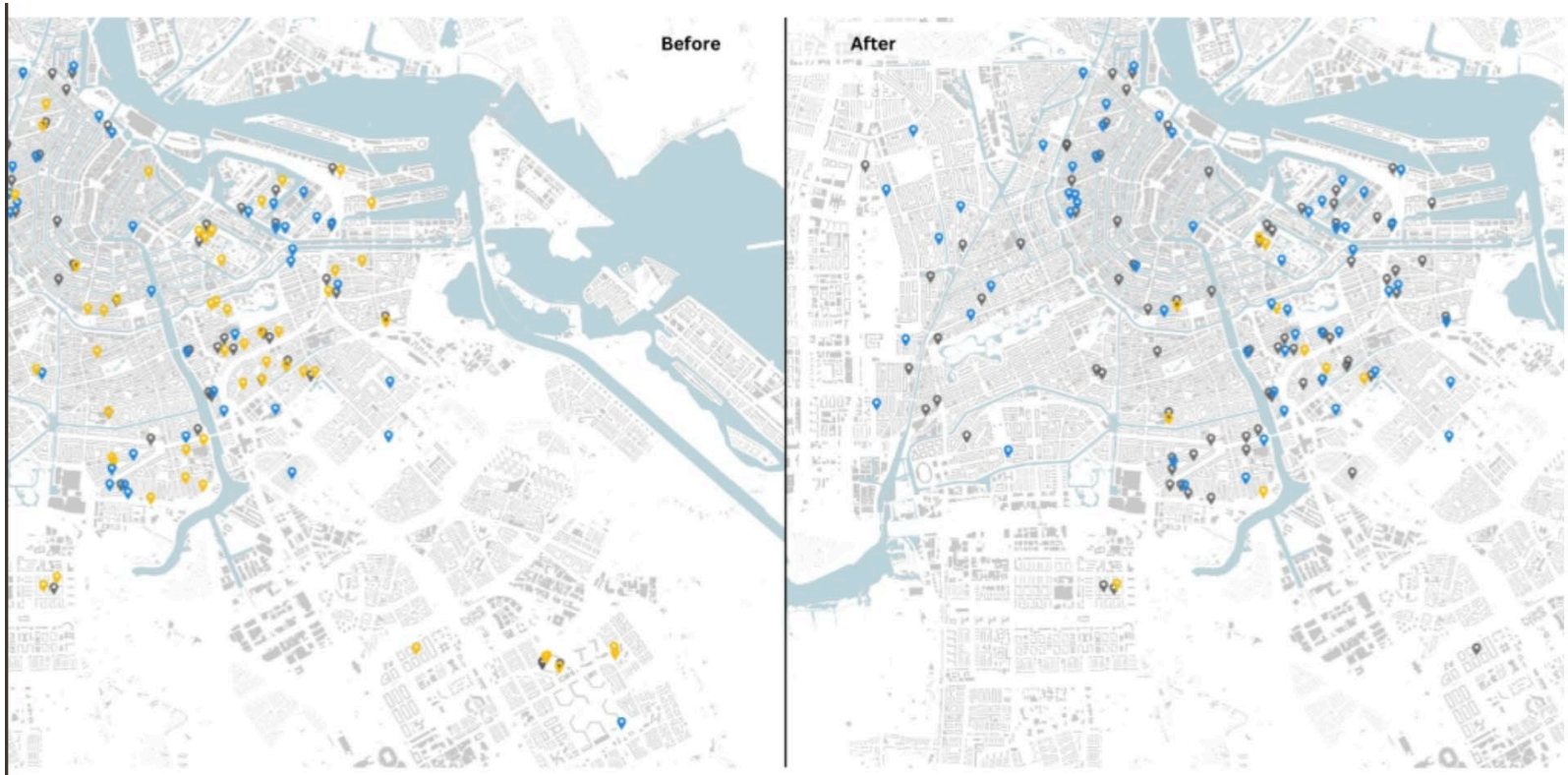
Participation by everyday use of socio-technical systems

ENERGY COACHING IN AMSTERDAM

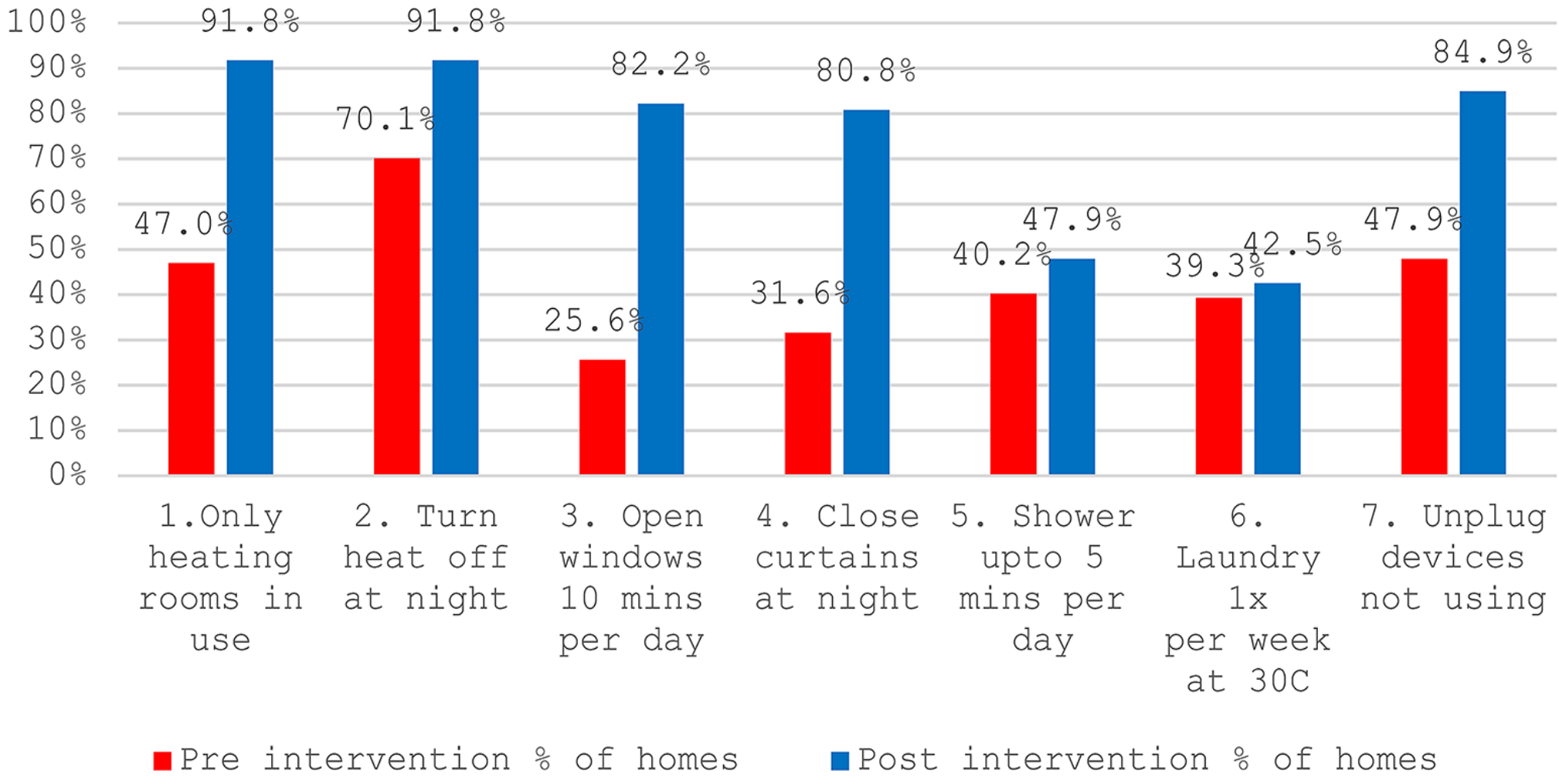
Energy coaching and smart technology halves energy bills for Dutch households



This map highlights the impact of energy coaching interventions. Before, 40 of 73 homes were energy-poor (colored yellow); after, only 10 remained (colored blue). These 10 homes had social benefits or spent over 20% of their income on energy.

Llewellyn, J., Venverloo, T., Duarte, F., Ratti, C., Katzeff, C., Johansson, F., & Pargman, D. (2025). Assessing the impact of energy coaching with smart technology interventions to alleviate energy poverty. *Scientific Reports*, *15*(1), 969.

Proportion of Homes Adopting Energy Efficient Behaviours



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"The level of energy literacy varied quite a bit from house to house. And if I went somewhere as an energy coach, it was never to moralise about energy use. I never said, 'Oh, you use way too much.' I worked with residents to find solutions that specifically suited their situation"

Joe Llewellyn

Research Fellow

"This research is valuable for the municipality. It provides insights for better energy poverty policies and, through the home visits, has directly helped reduce residents' energy bills"

Annoesjka Nienhuis

Program Manager for Innovation and Sustainability at the Municipality of Amsterdam (area development Zuidoost).

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JustRES Project

PARTICIPATION BY DELIBERATION

The methods

- Interviews to find out how people talk about justice issues in practice
- Survey 1500 citizens of Overijssel what they think is just (questions based on interviews)
- Participants in survey and others form *mini publics* in four municipalities in the two regions.
- Each mini public engages in deliberations either with an interactive map or with drawings
- Transcribed and analysed in atlas.ti

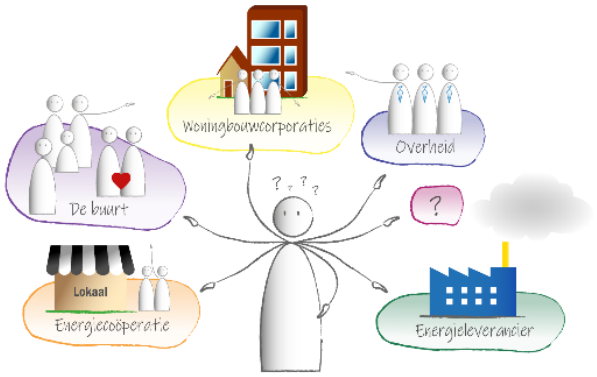
Interactive maps

Transparent maps

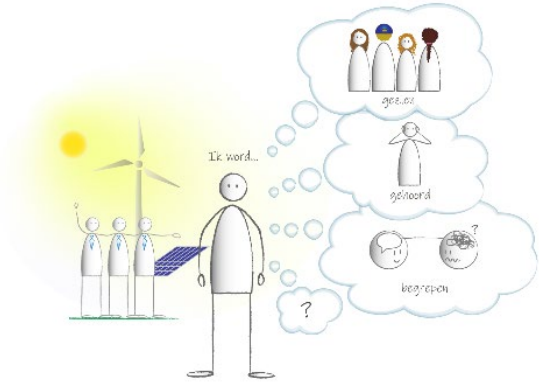
Online interactive maps

Drawings

1. Distributional justice



2. Procedural justice



3. Recognition justice

Findings - content

- Citizens frame justice claims through spatial and scalar references — from local to global levels.
- People recognize that policies at one scale can create injustices at many other scales beyond the region (e.g., subsidies or renewable installations).
- Regional energy transitions both shape and are shaped by existing socio-spatial inequalities.
- Understanding these multi-scalar justice concerns can improve policy design and communication around energy transitions.

Findings - methods

- Drawings and visuals invite citizens to articulate various concerns from their lived experiences and practices.
- Deliberations via geographical maps facilitated discussions about fairness in energy systems at large
- The use of visualizations and drawings enriched the depth and breadth of deliberations
- They invoked further academic thinking on deliberation and policies for employing local experiential knowledge, values and interests

Applications in your Energy Research

- In # groups; Pitch your project
- Select one project to work with
- Try to make a connection with participation or justice frameworks – draw / map / make a collage
- Present plenary