CENTRE FOR RESEARCH INTO ENERGY DEMAND SOLUTIONS

# Changing roles for individuals and organisations in the net zero transition. Policy and governance perspectives

Tina Fawcett, Environmental Change Institute, University of Oxford

Yael Parag, Reichmann University, Israel

11 OCTOBER 2022

# Agenda

Tina - Introduction – CREDS and the structure of this talk

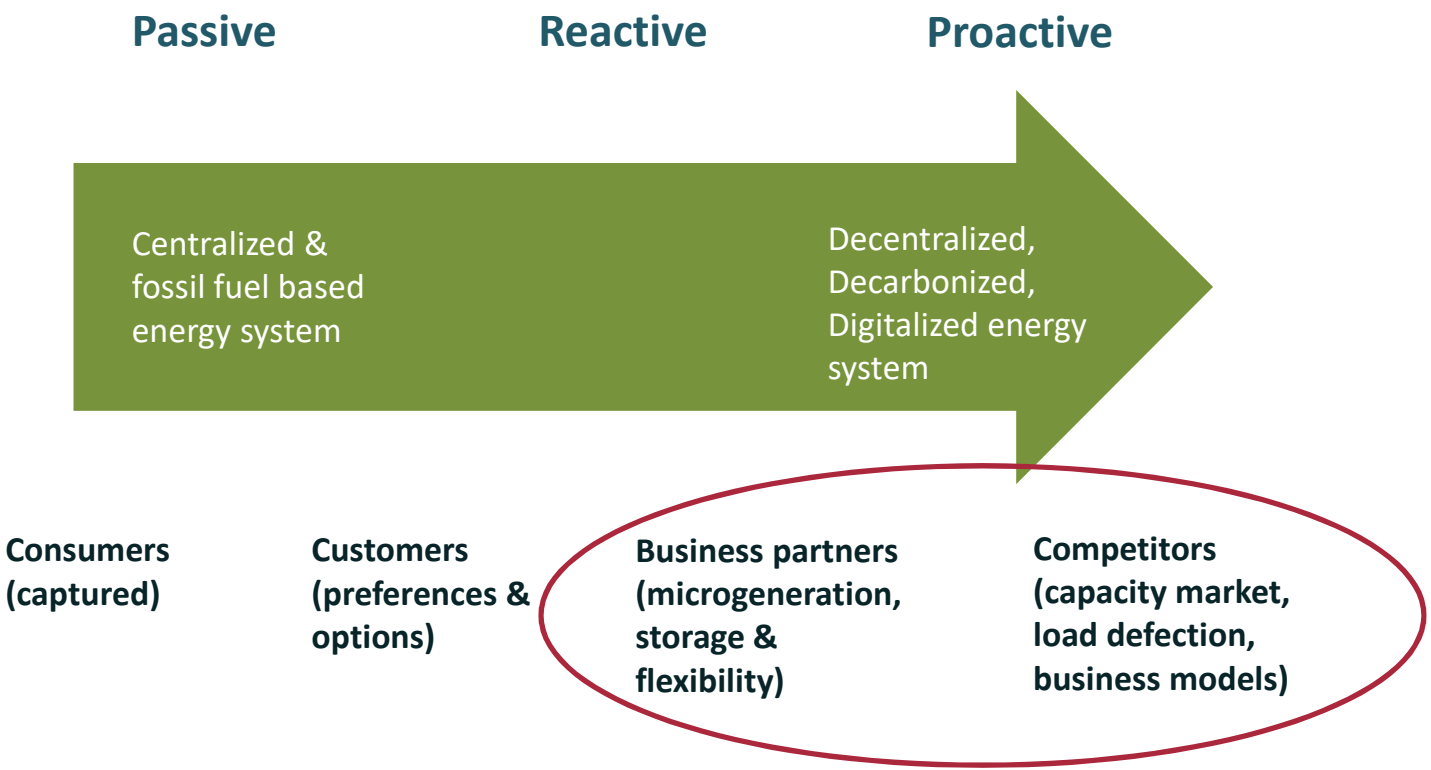
Yael - **The evolution of demand-side: what might be the implications to society?**

Brief questions / clarifications

Tina – **Consumers, citizens or carbon-saving champions? Individuals and their place in net zero energy policy**

Questions / Discussion

# Demand Side Evolution



# Demand-side distributed energy resources ("edge-of-the-grid")

Consuming energy

Demand reduction => Negawatts

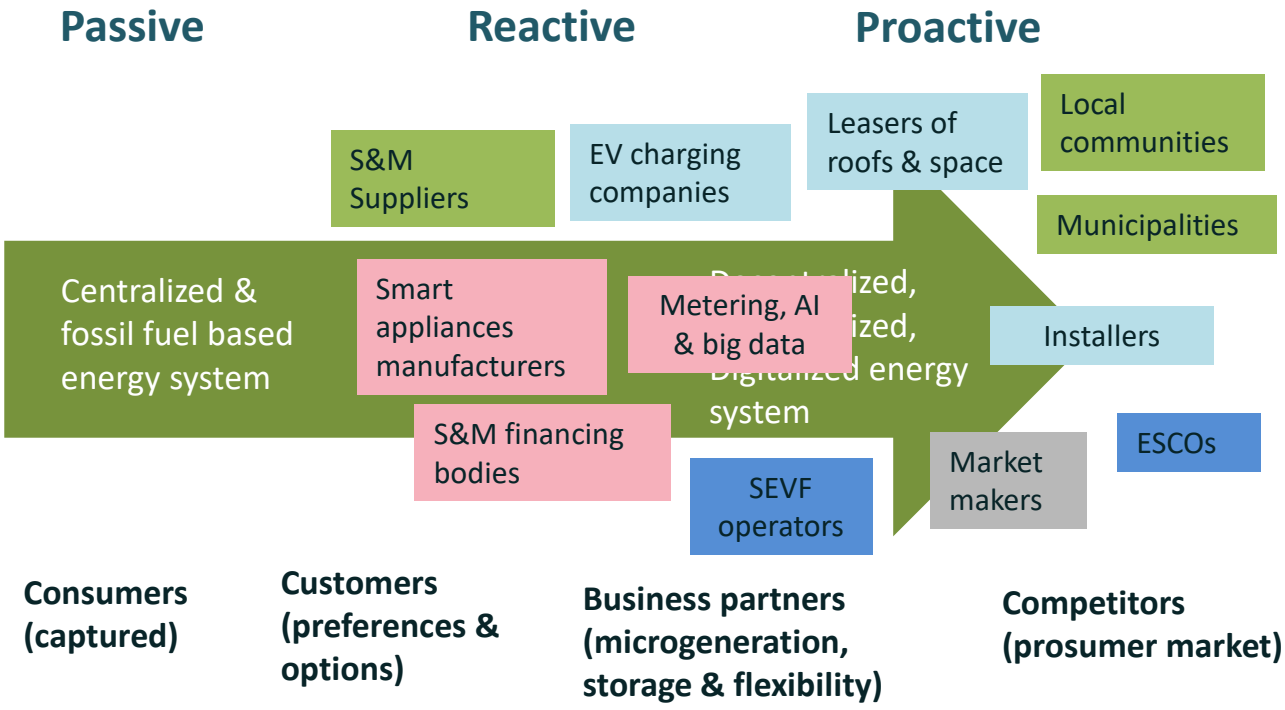
Microgeneration => Megawatts

Demand response => Flexiwatts

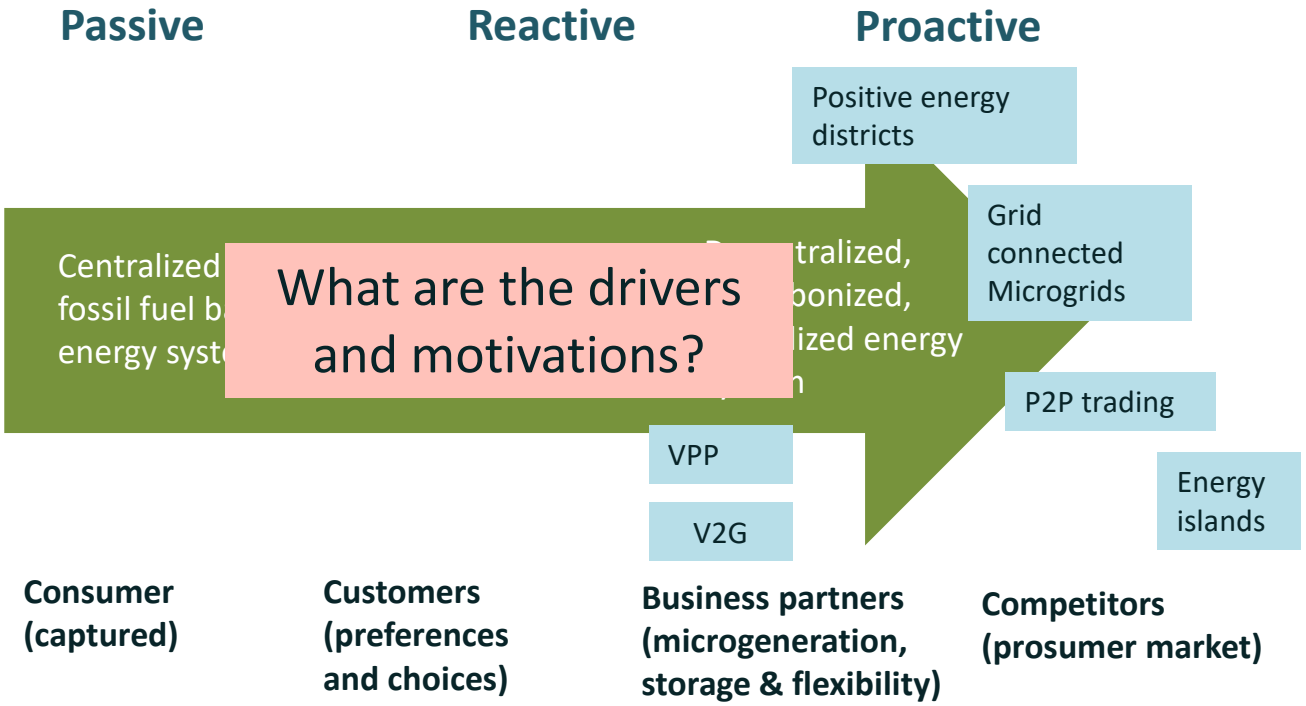
Storage => Storewatts

## Consumers => Prosumers

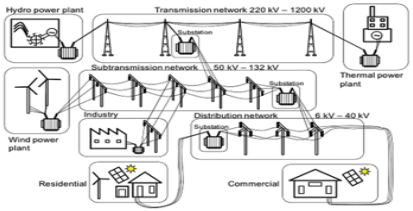

# Future energy landscape: New actors & business models



# New Energy Landscape



# Resources at the grid edge improve resiliency (?)

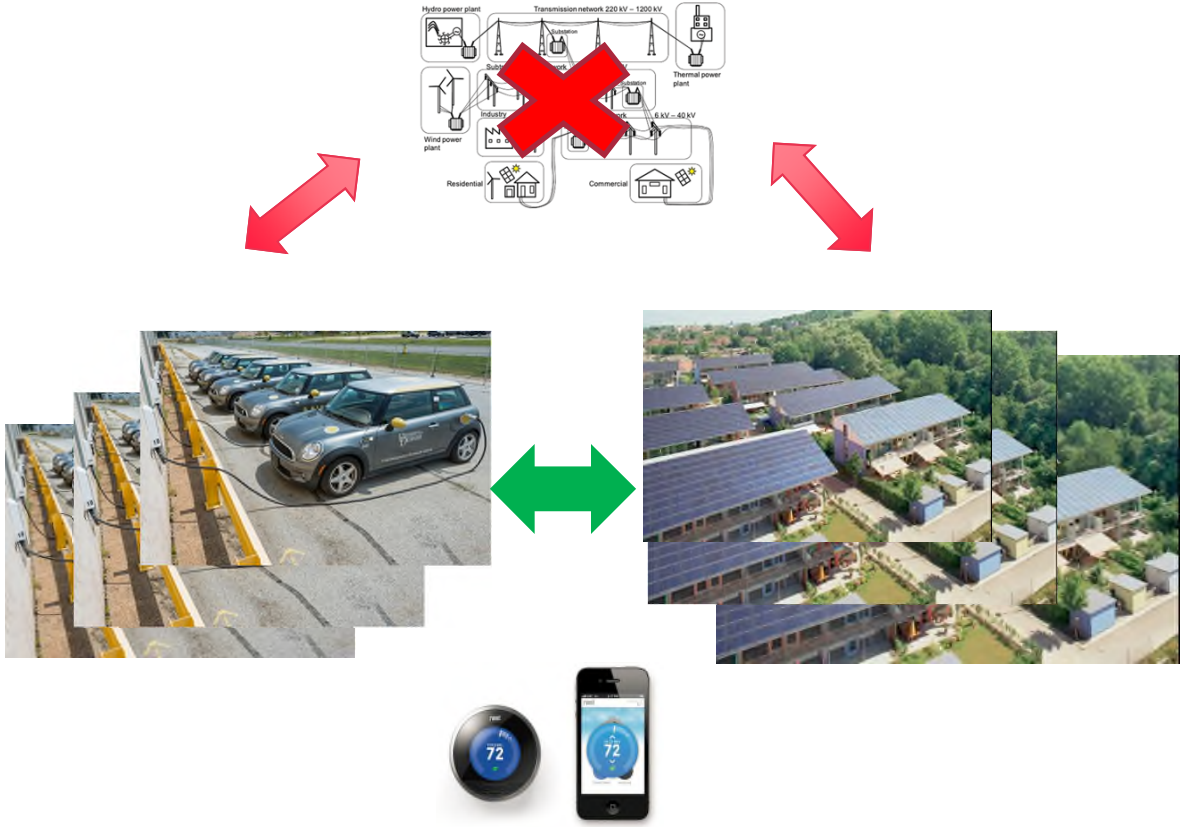



**Storewatts**:
FiT for storage (V2G)?
**Negawatts**:
Subsidies for Negawatts?

**Megawatts**:
FiT for generation
Net metering

**Flexiwatts:**
DR programs

**Reactive**


Hydro power plant
Transmission network 220 kV – 1200 kV
Substation
Thermal power plant
Industry
6 kV – 40 kV
Wind power plant
Residential
Commercial
72
72


## Is it good for society?


**Proactive**

Perspective

# Electricity market design for the prosumer era

Yael Parag & Benjamin K. Sovacool

*Nature Energy* **1**, Article number: 16032 (2016)
doi:10.1038/nenergy.2016.32

Published online: 21 March 2016

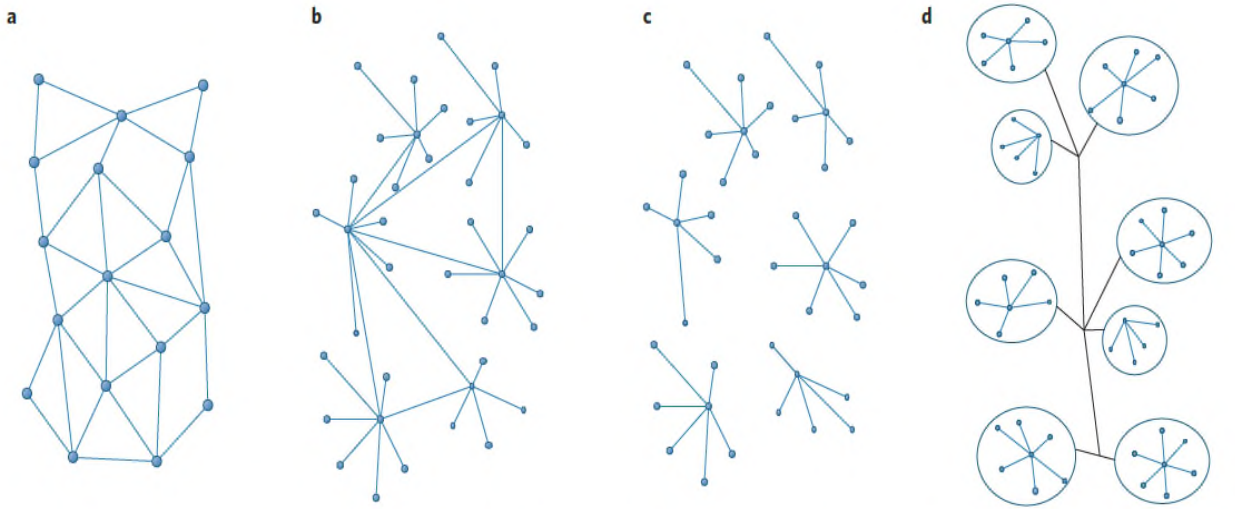
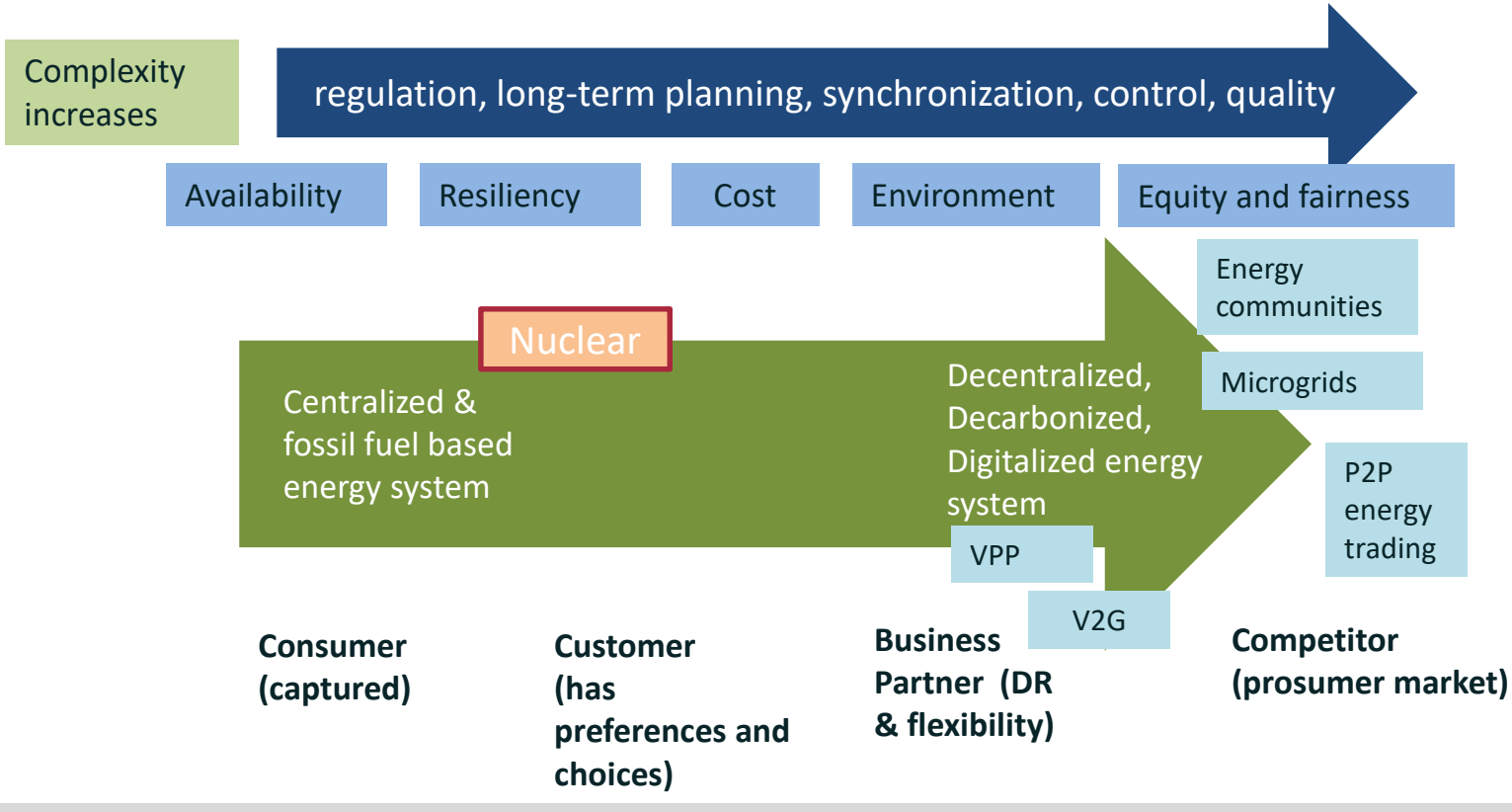



**Figure 1 | Structural attributes of three prosumer markets. a**, Peer-to-peer model, in which prosumers interconnect directly with each other, buying and selling energy services. **b**,**c**, More structured models involving prosumers connected to microgrids. These entail prosumer-to-interconnected microgrids, in which prosumers provide services to a microgrid that is connected to a larger grid (**b**), or prosumer-to-islanded microgrids, in which prosumers provide services to an independent, standalone microgrid (**c**). **d**, Organized prosumer group model, in which a group of prosumers pools resources or forms a virtual power plant. Dots represent prosuming agents; lines represent a transaction of prosuming service; circles represent an organized group of prosumers.

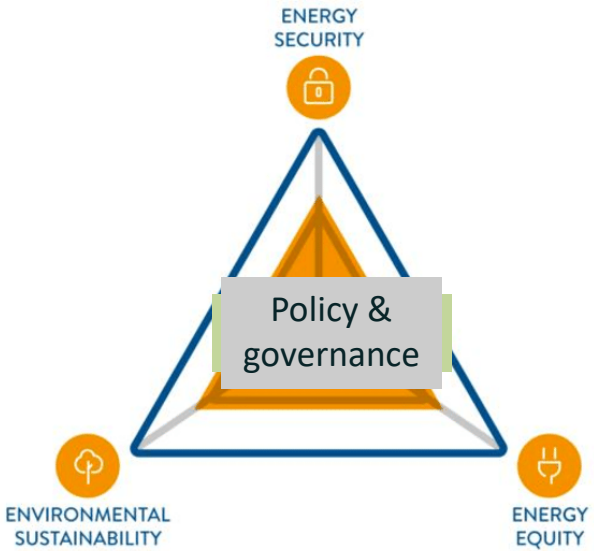
# Is highly distributed system good for society?



# Traditional evaluation framework for the energy system: The Energy Trilemma

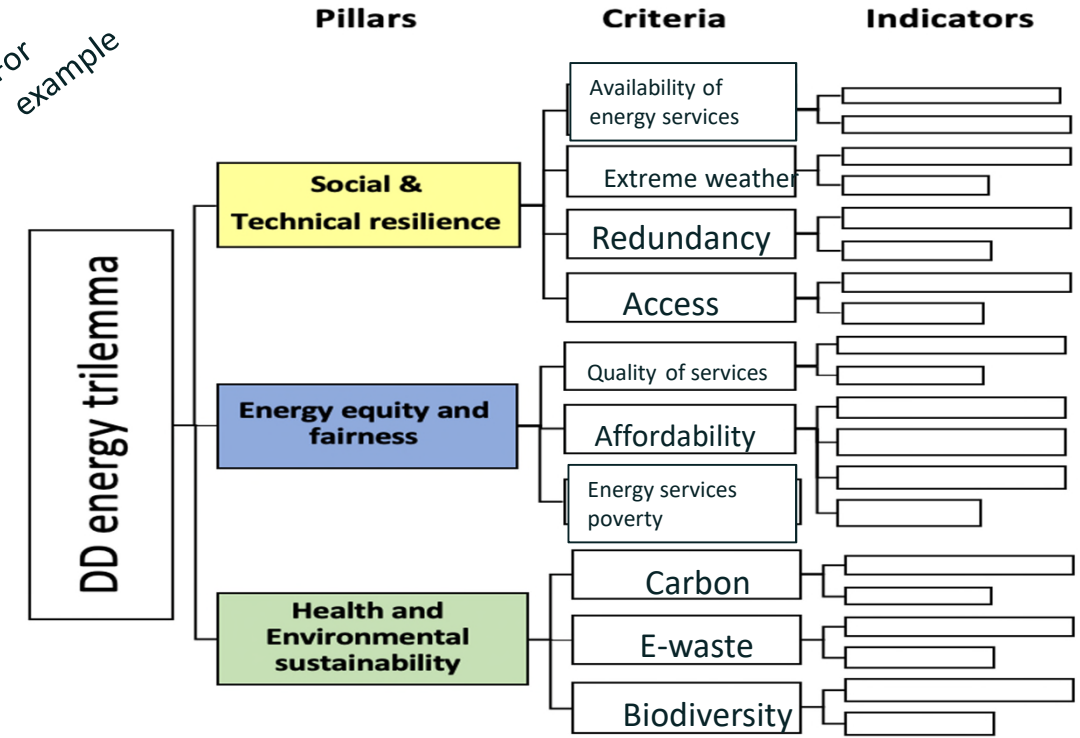
**Figure 1: World Energy Trilemma Index dimensions**

| | MEASURES | COVERS |
|---|---|---|
| **ENERGY SECURITY** | Ability to meet current and future energy demand | Effectiveness of management of domestic/external energy sources |
| | Withstand and respond to system shocks | Reliability and resilience of energy infrastructure |
| **ENERGY EQUITY** | Ability to provide universal access to reliable, affordable, and abundant energy for domestic and commercial use | Basic access to electricity and clean cooking fuels and technologies |
| | | Access to prosperity-enabling levels of energy and affordability |
| **ENVIRONMENTAL SUSTAINABILITY** | Ability to mitigate and avoid environmental degradation and climate change impacts | Productivity and efficiency of generation, transmission |
| | | Distribution, decarbonisation, and air quality |



# New (society-centered) Trilemma Tree and evaluation criteria for 3D energy systems

For example




What are the roles and responsibilities of people in this transition?


New tradeoffs?

# Research themes

How are individuals conceptualised in UK energy policy - active citizens co-creating the transition, passive consumers subjected to net zero policies, or something in between?

Which conceptualisations will help deliver effective policy for net zero?

**Research methods**

- Literature review
- Synthesis
- Policy analysis

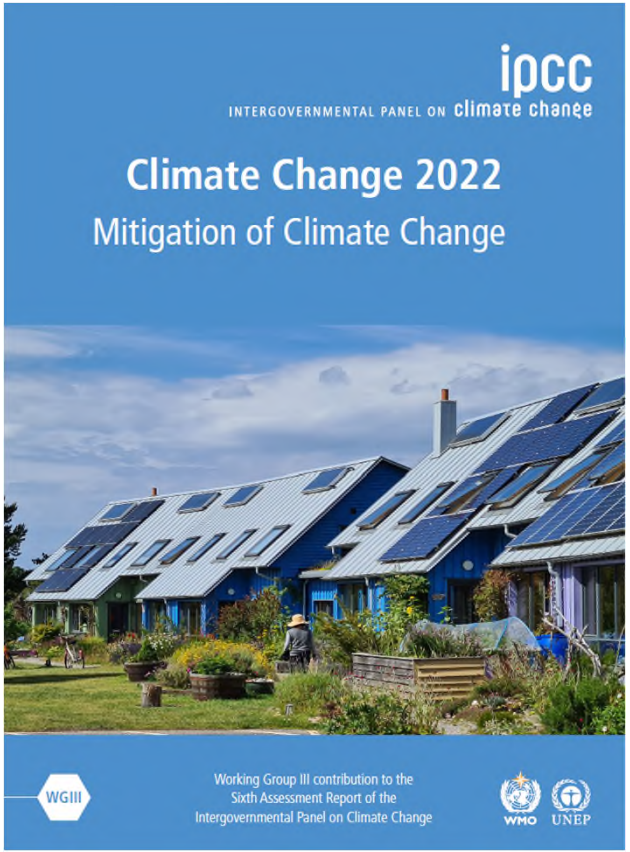

Reading Hydro, Community Energy Scheme

# Context: IPCC Working Group III: Mitigation of climate change

First time there has been a chapter focusing on demand: Chapter 5: Demand, services and social aspects of mitigation

**"FAQ 5.1 What can every person do to limit warming to 1.5°C?**

People can be educated through knowledge transfer so they can act in different roles, and in each role everyone can contribute to limit global warming to 1.5°C."



# IPCC Working Group III: Mitigation of climate change - Roles

Citizens

Role models

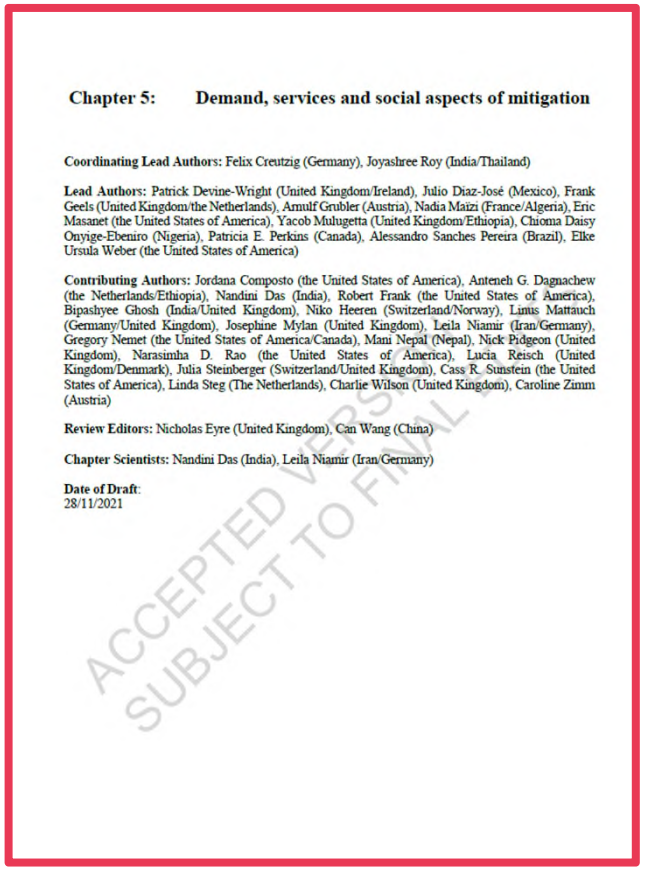
Professionals (e.g. engineers, urban planners, teachers, researchers)

Rich investors

Consumers (especially top 10% income globally)

Policy makers

Focus of much policy-making



**Chapter 5: Demand, services and social aspects of mitigation**

**Coordinating Lead Authors:** Felix Creutzig (Germany), Joyashree Roy (India/Thailand)

**Lead Authors:** Patrick Devine-Wright (United Kingdom/Ireland), Julio Diaz-José (Mexico), Frank Geels (United Kingdom/the Netherlands), Arnulf Grubler (Austria), Nadia Maizi (France/Algeria), Eric Masanet (the United States of America), Yacob Mulugetta (United Kingdom/Ethiopia), Chioma Daisy Onyige-Ebeniro (Nigeria), Patricia E. Perkins (Canada), Alessandro Sanches Pereira (Brazil), Elke Ursula Weber (the United States of America)

**Contributing Authors:** Jordana Composto (the United States of America), Anteneh G. Dagnachew (the Netherlands/Ethiopia), Nandini Das (India), Robert Frank (the United States of America), Bipashyee Ghosh (India/United Kingdom), Niko Heeren (Switzerland/Norway), Linus Mattauch (Germany/United Kingdom), Josephine Mylan (United Kingdom), Leila Niamir (Iran/Germany), Gregory Nemet (the United States of America/Canada), Mani Nepal (Nepal), Nick Pidgeon (United Kingdom), Narasimha D. Rao (the United States of America), Lucia Reisch (United Kingdom/Denmark), Julia Steinberger (Switzerland/United Kingdom), Cass R. Sunstein (the United States of America), Linda Steg (The Netherlands), Charlie Wilson (United Kingdom), Caroline Zimm (Austria)

**Review Editors:** Nicholas Eyre (United Kingdom), Can Wang (China)

**Chapter Scientists:** Nandini Das (India), Leila Niamir (Iran/Germany)

**Date of Draft:**
28/11/2021

# Language about individuals in the energy system

Consumer

Prosumer

Households

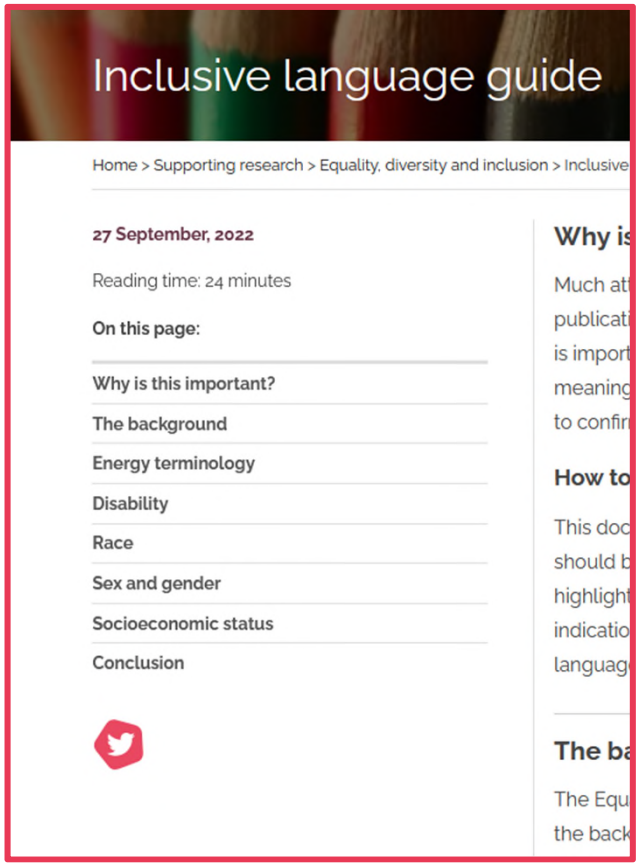
Citizen

Actor

Residents

Respondents, participants, interviewees

*Other words: Customer, Voter….*



# More on meanings (CREDS, 2022)

## Consumer

The term consumer still seems to be the dominant framing to describe participants in the energy system and comes historically from the energy industry. It has two distinct senses but is often used interchangeably and without definition:

- consumer as a user: 'one who consumes' energy
- consumer to mean a participant with some economic value or potential agency.

## Citizen

The term citizen is often used in the context of community energy – such as small scale and local projects – it tends to be interpreted as seeing people as less passive. …there can be a tendency to view 'citizen' as a stakeholder or co-owner 'motivated by non-market values'.

# Energy efficiency policy – focus on consumers

Energy efficiency policies are based on a variety of understandings of individuals, mostly rooted in economic and psychological perspectives. Individual response to policy is an important part of delivering higher energy efficiency and energy savings.

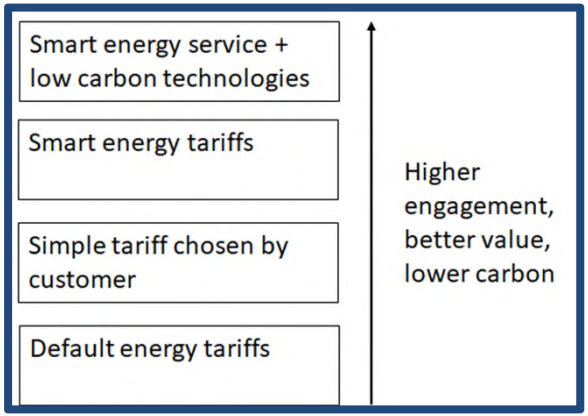
Policies include:

Energy / carbon taxation, Energy Company Obligations, Grants, Loans, Minimum energy efficiency standards, Labels, Information and advice

# UK government vision: people as active consumers in an energy market

The UK government sees value in people becoming more engaged in energy markets, but past efforts to engage the disengaged through appeal to economics and relying on market forces have largely failed (*hence the introduction of the energy price cap, now re-purposed in a time of high prices*).

Without a clearer understanding of how and on what basis individuals can be engaged in future markets, including for flexibility, these benefits may not be delivered.




UK government view of engagement outcomes in a future market (adapted from BEIS, 2021)

# Limits of a consumer focus in governance: Energy price rises and energy markets


Citizens Advice report, Dec 2021

At that point almost 4 million household had seen their energy supplier go out of business.

Cost of failures = £2.6bn

Calls for regulator to move beyond ‘consumer’ and economics focus.

# Is a focus on people as consumers preventing some policy initiatives?

**Tory MPs urge Truss to launch campaign on cutting energy use**

**Intervention comes amid reports No 10 blocked public information campaign over 'nanny state' fears**

The Observer
Energy bills

Analysis

**Experts attack government inaction over energy-saving guidance**

*Robin McKie*

'Advice is the very minimum' ministers should be providing in crisis, says climate change specialist

Sun 9 Oct 2022 12.00 BST

10 | The Observer 09.10.22 | Energy

**Anger as Truss ignores her climate advisers' call for energy-saving drive**

PR campaign

Shanti Das, Rebecca Brahde & Michael Savage

Rising costs are also forcing councils around country to ration energy use, raising fears for safety of vulnerable people

Liz Truss has ignored the government's own climate advisers in opposing an energy-saving campaign this winter, it has emerged, amid mounting frustration over her resistance to the plan.

The advisory body the Climate Change Committee wrote to the prime minister last month outlining the need for a "comprehensive energy advice service" to reduce demand.

"Public awareness of what can be done to reduce energy use [either in homes or businesses] is too low," the advisers wrote. "Specific advice on this could help in the near term by

Politics | Parliaments | Brexit

**Energy use advice campaign pulled as No 10 objects**

News headlines 7-9 Oct 22

# Beyond consumers: new technology adoption & use

The potential to deliver policies and changes that go 'unnoticed' by the public is now limited.

- Lower carbon heating cannot be achieved by more gas / oil boiler efficiency regulations, but by a switch to heat pumps or other systems dependent on zero carbon energy supply.
- Vehicle owners must switch to EVs.

The changes needed are so vast, that governments do not have the luxury of relying on 'stealth' policies.

# Beyond consumers: Politics and legitimacy

People need to feel that they, their families and their communities are active participants in the transition – not passive recipients or, worse, victims of it.

Approaches to tackling climate change need to give people a sense of agency in their own lives and communities and ensuring solutions are adapted to local strengths and ways of life, with strong local democratic control over solutions, and local benefits secured.

# Beyond consumers: The energy saving imperative in the current crisis

News ▸ Irish News ▸ Energy

## Top energy saving tips as Government launches 'reduce your use' campaign and household supports

Ireland imports over 70% of the energy we use. This compares to a European Union total of almost 60%.

NEWS By Sarah Barrett Reporter

13:23, 18 MAY 2022 | UPDATED 14:59, 19 MAY 2022

iea

Countries Fuels & technologies Analysis Data Policies

Press release

## Energy saving actions by EU citizens could save enough oil to fill 120 super tankers and enough natural gas to heat 20 million homes

21 April 2022

FROM POLITICO PRO

## Here's what EU countries are doing to save energy ahead of winter

Countries across the bloc are drafting plans to slash energy demand to ward off shortages.

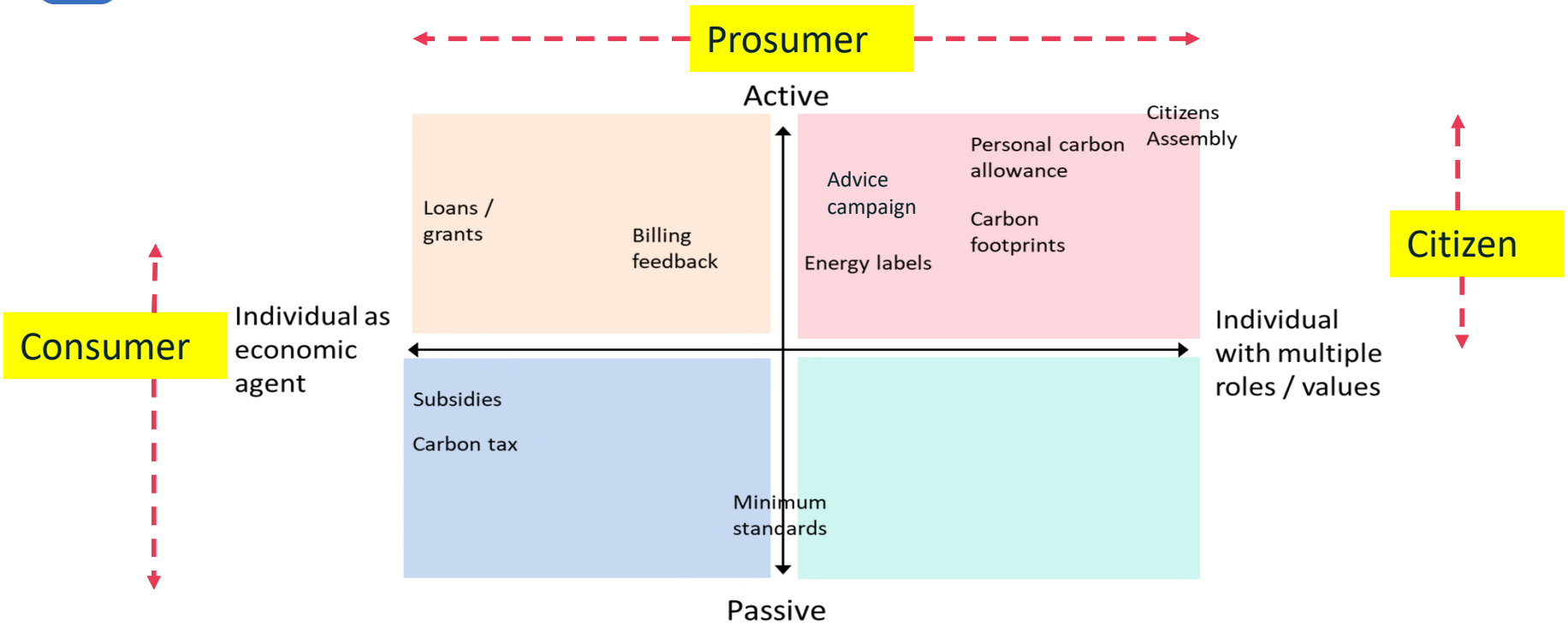
Home / News / Energy & Environment / The Green Brief: Is Europe finally taking energy conservation seriously?

## The Green Brief: Is Europe finally taking energy conservation seriously?

By Frédéric Simon, Kira Taylor, Nikolaus J. Kurmayer and Valentina Romano | EURACTIV 14 Sept 2022

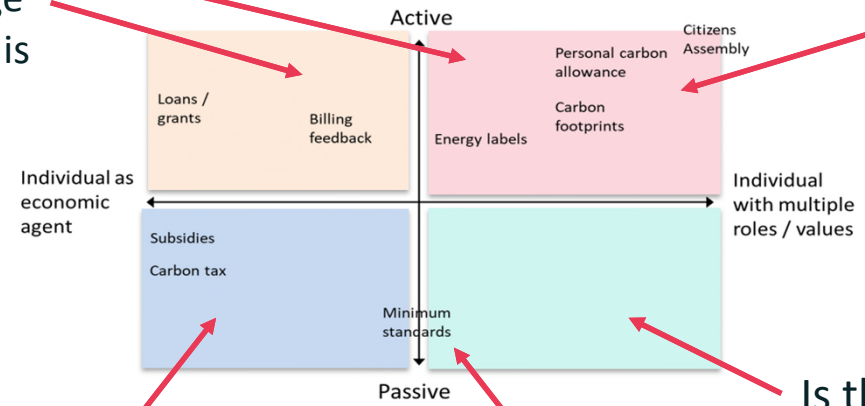
Advertisement

# Policies characterised in terms of individual engagement and roles in the energy system



# Issues raised by this characterisation of policy

not everyone has the capacity to actively engage with the energy system – is that important for these policy quadrants?




Can policies in this quadrant deliver deeper change?

Would it be easier if we only needed policy in this quadrant?

Effective policy doesn't always need individual engagement

Is there really nothing here?

# Conclusions (1)

- UK energy policy primarily treats people as consumers – either as purchasers of homes / energy-using equipment or as energy users with habitual behaviours which can be changed, mostly through economic incentives and provision of information.
- This engages people with one aspect of the energy trilemma – affordability – but not with environment or security.
- Many policies require people to be active consumers, although one of the most effective policies – minimum efficiency / carbon standards – does not. (However, democratic consent is required for setting these standards – what will happen when the deadline for phasing out of natural gas / fossil-fuelled vehicles arrives?)

# Conclusions (2)

Policies which combine multiple levers of change, economic, social and psychological, and/or which move beyond efficiency to sufficiency, will be important in the energy transition. This will mean moving away from solely a consumer model, to frame policies for citizens.

There are reasons in principle and practice to prefer engaged citizens. However, this puts more responsibility onto individuals, not all of whom have capacity to act.

By looking at policy in this way, and focusing on the underlying theories of change, we can think about how policy design needs to evolve to deliver greater carbon emissions reductions, faster and fairly.

# References


BEIS (2021) Policy paper overview: Energy retail market strategy for the 2020s. Department for Business, Energy and Industrial Strategy. London, UK.

Citizens' Advice (2021) Market meltdown: How regulatory failures landed us with a multi-billion pound bill. Citizens' Advice. https://www.citizensadvice.org.uk/about-us/our-work/policy/policy-research-topics/energy-policy-research-and-consultation-responses/energy-policy-research/market-meltdown-how-regulatory-failures-landed-us-with-a-multi-billion-pound-bill/

CREDS (2022) Inclusive language guide. https://www.creds.ac.uk/inclusive-language-guide/

Fawcett, T. (2022) The expected role of individuals in the transition to net zero: policies and pathways facilitating an active role (1-310-22). ECEEE 2022 Summer Study on energy efficiency: agents of change. European Council for an Energy Efficient Economy, 6-11th June. Hyères, France.

Parag, Y., Sovacool, B. (2016) Electricity market design for the prosumer era. Nature Energy 1(4):16032