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# Flex-ability for all: Pursuing socially inclusive demand-side flexibility in Europe

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# About RAP

Regulatory Assistance Project (RAP)<sup>®</sup> is an independent, global NGO advancing policy innovation and thought leadership within the energy community.

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An aerial photograph of a building's roof, showing a mix of red-tiled sections and large rectangular solar panels. The solar panels are arranged in a grid pattern, with some sections appearing to have a blue-tinted glass or protective layer. A dark blue rectangular overlay covers the middle portion of the image, containing the text 'Background and context'. On the left side of this overlay, there is a vertical bar with a yellow-to-orange gradient. The overall scene is captured from a high angle, looking down at the roof structure.

# Background and context



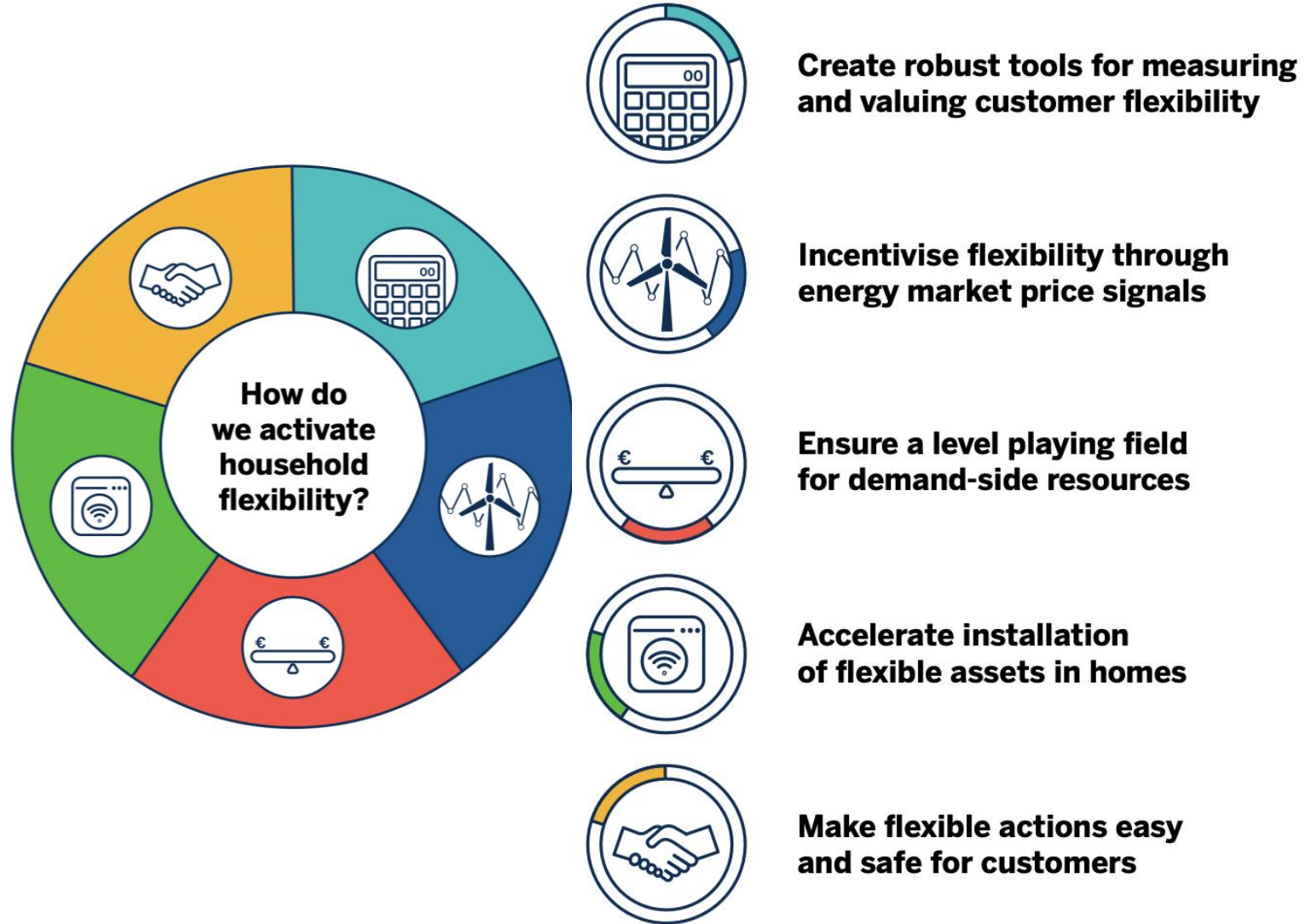
## Joy of Flex (2022)

How to align household and system needs to scale up flex as an energy system resource.

Five-point action plan.



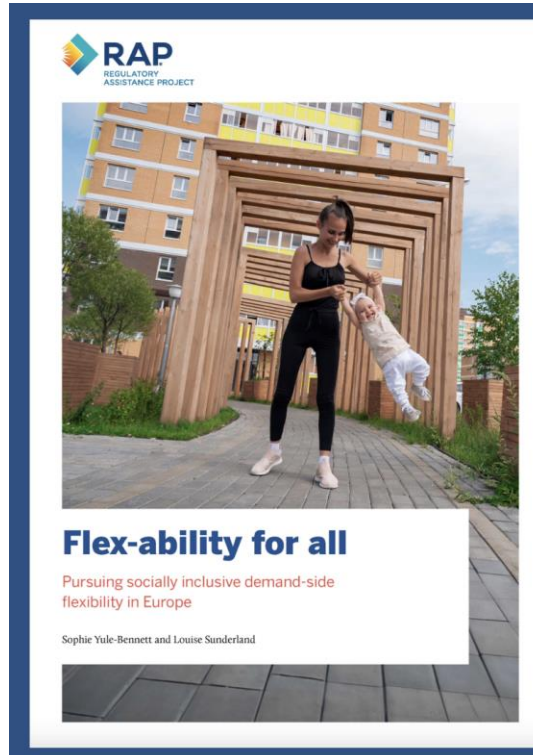
*Demand-side flexibility is more than an individual customer right; it's a vital, cost-effective system resource that should be valued as such.*



## Flex-ability for All (Jan 2024)

Deep-dive into risks, barriers and opportunities for low income and vulnerable households.

People/needs focus.



*For flexibility schemes, technologies and offers to be inclusive, they must not only be accessible to lower income and vulnerable households – they must also meet their needs.*

**Those able to flex their energy use can access significant savings and revenue.  
How can we bring these direct benefits to the people who need them the most?**



An aerial photograph of a residential roof covered with solar panels. The panels are arranged in a grid pattern, with some sections showing a blue tint and others a more natural brownish-orange color. A large, semi-transparent blue rectangle is overlaid on the center of the image, containing the title text. The background image is partially obscured by this overlay and decorative elements like a yellow and orange vertical bar on the left and a horizontal bar at the top.

# Households and the energy transition



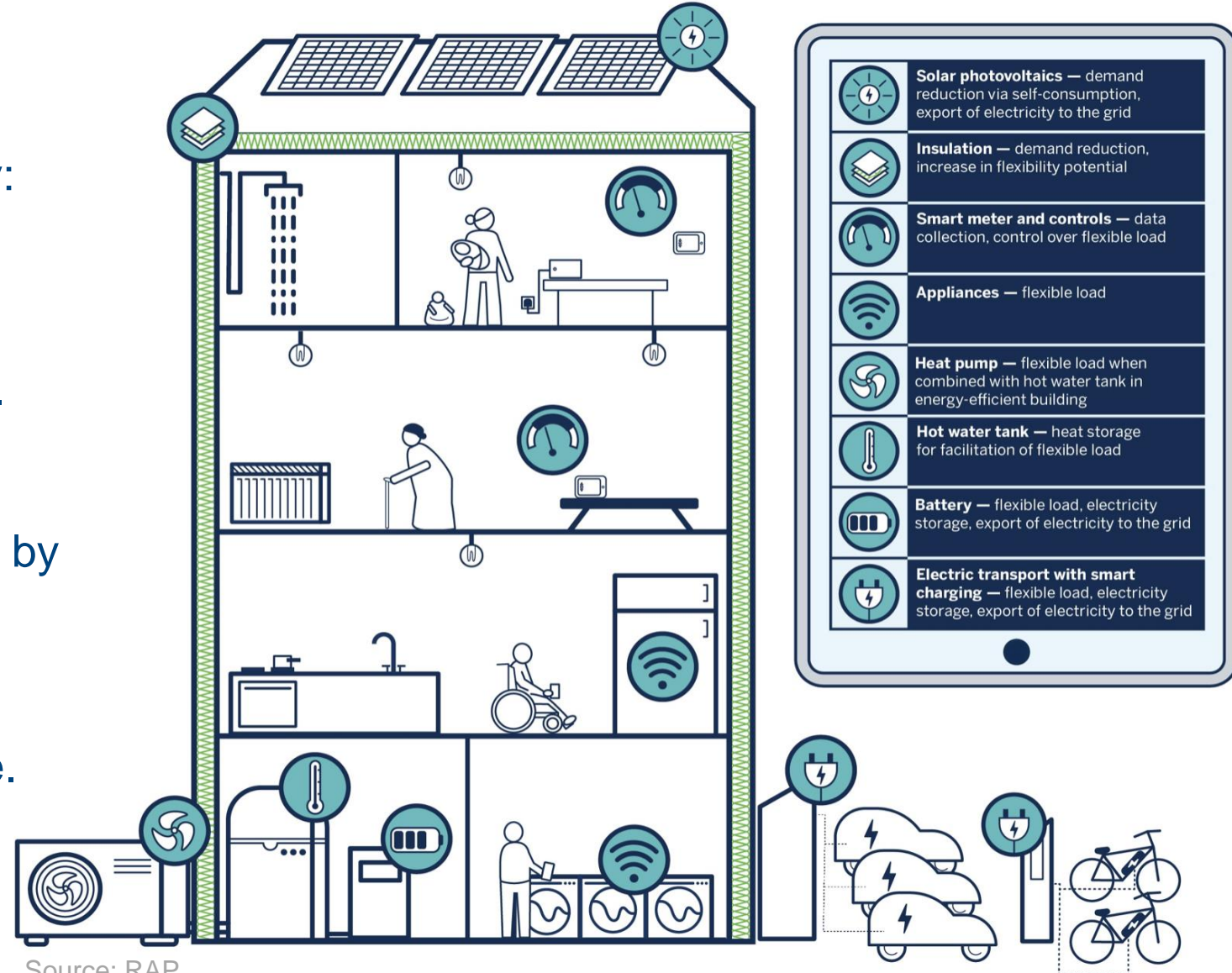
# Home is where the smart is

**Demand-side flexibility** = customers responding to electricity market signals by:

- shifting controllable energy uses
- utilising onsite generation (rooftop PV), storage and energy efficiency.

Electric home heating and EV smart charging set to be greatest source of DSF by 2030 (smartEn/DNV 2022).

**When and where** we use energy will determine cost, not just how much we use.



Source: RAP

# Why is DSF important?

- Net-zero emissions by 2050 requires tenfold DSF increase worldwide by 2030 - IEA (2021). Double in EU.
- Integrate variable renewable generation and newly electrified loads at least cost. Minimise grid upgrades.
- Old: schedule supply to meet load  
New: schedule load to meet supply





## Reliability

Optimise network and power assets to reduce grid congestion, curtailments and outages.  
Future-proof grid for electrification of end uses.

Support system integration of variable renewables.

Secure higher level of service and safer conditions for all consumers.

## Equity

Achieve a least-cost transition with opportunities to reduce energy poverty and improve quality of life.

## Sustainability

Accelerate fossil energy exit and renewable energy uptake to achieve zero-emissions energy system.

Reduce system costs, including need to support renewable generation.





Why is **INCLUSIVE** flex important?



# Europe has reached a critical juncture



Source: PowerPoint

Energy poverty is no longer a marginal debate.

Backlash against decarbonisation costs in some countries.

New flex value streams being unlocked by policies and emerging markets (CE4All, EMD)

But inclusion and empowerment not currently a priority for most flex schemes, techs and offers.

The wider cost of 'missing out' is not measured or managed.

# Not all flexibility is equal (to households)



Energy system – a kWh is a kWh.

But the way flex is extracted and experienced changes with affluence (tech/manual).

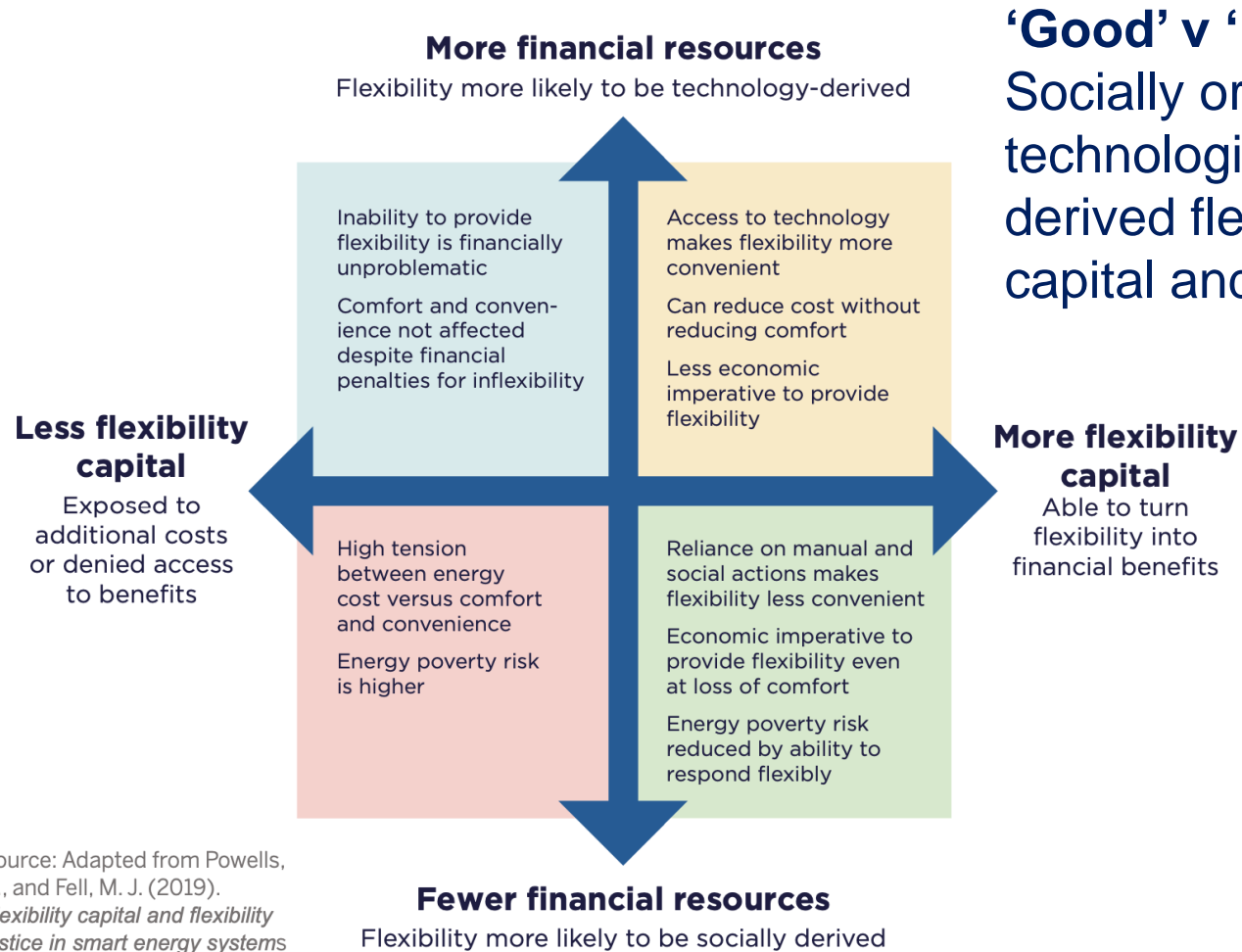
**Flex-ability** = passport to greenest and cheapest energy

**Poor flex-ability** = risk of rationing, higher bills and increased domestic labour.

Impacted by factors beyond income. But structural barriers reflect existing inequities.

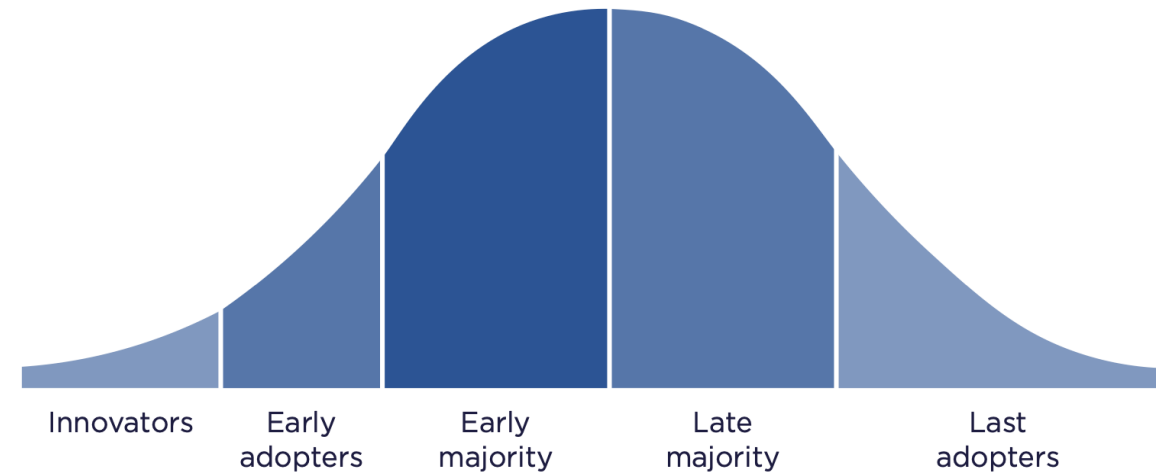


# Opening direct benefits without burdens



**‘Good’ v ‘bad’ flex**  
Socially or technologically derived flexibility capital and affluence

**Won’t everyone catch up?**  
Traditional technology adoption curve must be reversed for innovation to serve those most in need



Source: Adapted from Pnautilus. (2011, 14 July). *Innovation adoption lifecycle*

Source: Adapted from Powells, G., and Fell, M. J. (2019). *Flexibility capital and flexibility justice in smart energy systems*





# A vision for inclusive flexibility





## What does inclusive flexibility look like?

Europe lacks a common policy vision.

We used research and case studies to establish key principles to use as a framework for policy and product design.





**How do we get there?**



# Call to action: Three no-regrets steps



**Target the right  
kind of flexibility**  
so schemes  
meet needs



**Plug the  
technology gap**  
through prioritised  
deployment



**Build a bridge  
to flexibility**  
with low-risk  
retail offers

# Target inclusive flex not just kilowatts



**Target the right kind of flexibility**  
through needs-focused schemes

## Focus: Flexibility policies and schemes

- Policy mechanisms to drive flex must not be blind to household experience and impact.
- Language and visibility around social qualities of flex. Common indicators of home flex potential.
- Better integration of flex and other schemes and incentives (e.g., energy efficiency *plus flex*)

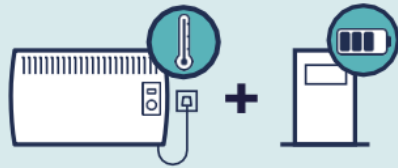


# Priority access to flex-enabling assets



## Focus: Building upgrades/tech deployment

- Get flex-enabling renovations, techs and controls into low income/vulnerable homes *first*.
- Utilise winning flex combinations:
  - Flex existing water tanks and storage heating to match wind/solar.
  - Combine flex techs within or between homes to maximise value.



### Electric heaters plus batteries

Example: Warmworks and Dumfries and Galloway Housing Partnership installed batteries and supported tenants to move to optimal tariffs, enabling the use of existing electric heaters to serve heating needs for the whole day with electricity bought at lower prices.

Source: Warmworks. (n.d.). *Domestic battery storage*. <https://www.warmworks.co.uk/our-work/domestic-battery-storage/>



### Hot water tanks plus smart controls

Example: EnergyCloud, working with Clúid Housing, installed smart controls on existing hot water tanks so tenants could access free hot water at times of surplus wind generation on the grid, utilising clean energy that otherwise would go to waste.

Source: Clúid Housing. (n.d.). *EnergyCloud and Clúid Housing announce renewable energy partnership*. <https://www.cluid.ie/medias-centre/energy-cloud/>



### Solar plus batteries

Example: A subsidy scheme in Greece is designed to allow households to use batteries to control when they use the grid and when they export their solar power, maximising the return on investment and providing backup power.

Source: Tsagas, L. (2023, 29 March). *Greece launches €200 million residential solar-plus-battery subsidy scheme*. *pv magazine*. <https://www.pv-magazine.com/2023/03/29/greece-launches-e200-million-residential-solar-plus-battery-subsidy-scheme-2/>



### Air-source heat pump plus solar plus batteries

Example: Warmworks and Angus Housing Association installed solar panels and batteries alongside newly electrified heating so more solar energy could be used on-site, providing heat after sunset and reducing tenants' bills.

Source: Warmworks. (n.d.). *Renewable heat project with Angus Housing Association*. <https://www.warmworks.co.uk/our-work/renewable-heat-project-with-angus-housing-association/>



# Build a safe retail runway to flex



## Focus: Electricity retail market and services

Ensure households can access direct flex benefits, with protections against financial risk and uncertainty.

- ‘Upside only’ or fixed rate offers, turn up schemes.
- Transitional safeguards: Shadow billing, money back guarantees.
- Smart + social tariff combinations.



## 'Upside only' offers

Reward flex actions without penalising failure to deliver.

**EnergyCloud, Ireland:** Free hot water for social housing when wind surplus.

**Octopus/UKPN 'Power Ups':** Periods of free electricity, notified ~an hour in advance when renewables surplus anticipated.



## Combining social + market tariffs

**Spain:** Social tariff discount applied to low-income households on default regulated dynamic retail tariff.


Other ideas to use subsidies to de-risk commercial flex offers or provide smart social tariffs?



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# Concluding thoughts





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*“People don’t want raw kilowatt-hours...  
They want hot showers, cold beer, comfort,  
mobility, illumination.”*

Amory Lovins, Rocky Mountain Institute





# Concluding thoughts



Make the energy market work for customers, don't make customers work for the energy market.



The retail supplier of tomorrow is a tech company. Value in data, new markets and services blend – are we regulating the right activities?



Prioritise low income and vulnerable households for flex-readiness. Use low-risk offers to reduce energy inequities, avoid new layers of exclusion.

# Further resources

- [RAP Taking the Burn out of Clean Heating for Low-income Households report \(2022\)](#)
- [CAN-E video on clean heating and low income households \(with Louise Sunderland\)](#)
- [RAP Joy of Flex report \(2022\)](#)
- [CAN-E animation \(loosely based on the Joy of Flex\)](#)
- [RAP webinar for Electrification Academy: Five key actions for scaling up household flexibility](#)
- [RAP Time is Now report for EV Smart Charging report \(2022\)](#)
- [RAP Flex-ability for All report \(2024\)](#)



An aerial photograph of a building's roof, featuring a central section with red tiles and several large rectangular areas covered in blue metal grates. A dark blue semi-transparent banner is overlaid across the middle of the image, containing the text "Questions and discussion".

# Questions and discussion





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