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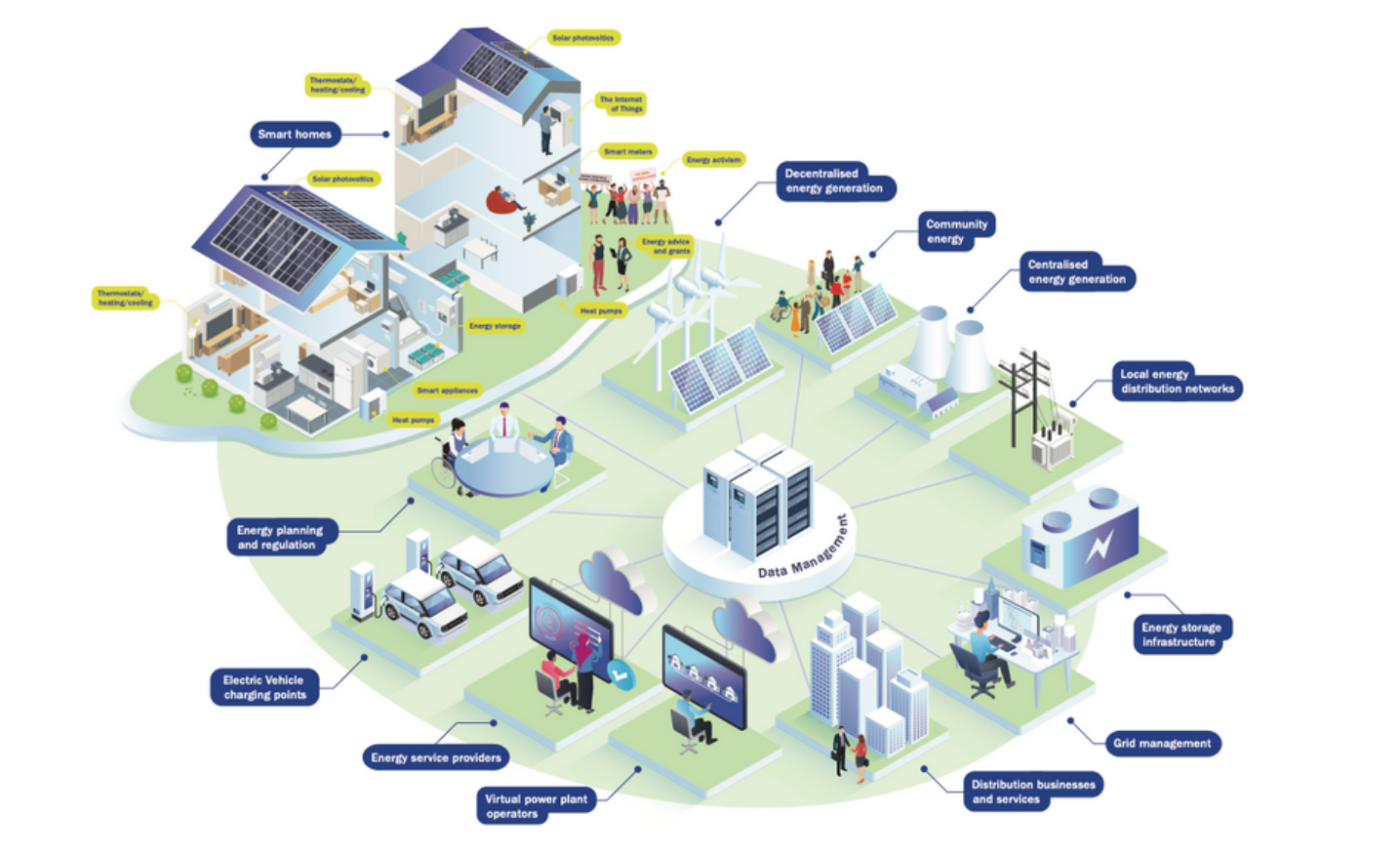
How Mid-sized Cities Can Inclusively Digitalise Their Energy Systems

By Richard Flockemann, Siddharth Sareen, Håvard Haarstad, Morten Ryen Loe, Sonia Gantioler, Jessica Balest, Silvia Tomasi, Nives DellaValle, Federico Voltolini, Chiara Pellegrini, Adrian Smith, Benjamin Sovacool, Marie Claire Brisbois, Gerardo A Torres Contreras.



KEY POINTS

- **Many mid-sized cities are trying to digitalise their energy systems, as part of the push to net zero.**
- **Surprisingly, digitalisation is often happening in a way that makes social inequalities worse.**
- **This can decrease the perceived legitimacy and uptake of digital technologies—which threatens cities' ability to meet their net zero targets.**
- **So a key policy challenge for mid-sized cities is how to digitalise their energy systems inclusively and fairly.**
- **Our three-fold mantra can help: Including -> Organising -> Commoning**

SUMMARY

ROLES studied how mid-sized cities are digitalising their energy systems, as part of efforts to reach net zero.

We did this by conducting comparative fieldwork across three sectors in three different mid-sized cities. We looked at urban transport in Bergen, smart electric meters in Trento, and smart local energy systems in Brighton and Hove, between 2020 and 2023.

This note shares our most relevant research insights with those working in the digitalisation space including policymakers at national and municipal levels, energy companies, charities, and activist groups.

It also proposes tools for ensuring this digitalisation is inclusive and fair.

DIGITALISATION

Net zero and digitalisation

Digitalised energy systems are interconnected and automated energy systems that rely on a range of digital technologies. These include things like:

- Smart meters
- ICT-integrated transportation and electricity demand services
- Automated building management
- Home energy management systems
- Smart homes

Many cities are digitalising their energy systems in order to hit their net zero targets. One of the challenges of shifting to renewable energies, like wind and solar, is that we have to learn to cope with a more intermittent energy supply.

Managing an intermittent supply is something digitalised energy systems can help with. Digital technologies can help us move our energy use patterns to when supply is abundant, and ensure we have what we need when it's scarce.

Digital technologies are also useful for designing carbon-neutral **urban mobility** systems. Digital technologies can give local governments access to vast amounts of data and algorithmic platforms. This can help improve governments' understanding of people's transport needs, leading to more useful transport infrastructure. It also allows cities to introduce new forms of app-based mobility like ride- or car-sharing.

Making inequalities worse

In some circles, there has been a lot of enthusiasm about the potential of digital energy technologies to democratise and equalise the supply and use of energy. But we found that, as currently implemented, digitalisation can actually make energy systems less democratic and more unequal.

This is potentially a serious obstacle to our net zero ambitions. In all three of our focus cities, many people feel frustrated with how digitalisation is going, and are suspicious of emerging digital technologies.

This makes it much more difficult to get people to actually use the technologies that digitalisation depends on.

OPENING CLOSED DOORS

Energy experts aren't the only people we should talk to

Our interviews suggested that a major reason for this frustration is that officials tend to make key decisions about digitalisation behind closed doors in consultation with incumbent energy companies and new digital companies.

This often leads to pilot projects and implementation plans that focus too much on early adopters.

Early adopters are generally wealthier, and don't always have the same energy and transport needs as the rest of their community. Designing an energy system with only them in mind risks exacerbating existing inequalities in our energy systems, and causing frustration.

How inclusion can help

Our work suggests that a more inclusive, participatory approach to decision-making would alleviate some of the frustration and suspicion around these technologies, and make digitalisation much more likely to succeed.

This means thinking about energy users as active participants, not passive consumers. And that means giving people more say about how their energy systems work.

We have a threefold mantra that can help policymakers do this:

- **Including**
- **Organising**
- **Commoning**

INCLUDING

More say, not more products

Our research found that energy policymakers tend to take a consumer-oriented approach to inclusion. That means they think of inclusion in terms of providing more services or products that cater to a wider range of customers.

A more effective approach, we found, would likely start with thinking about users as **active participants** in system design, not passive consumers. And that means giving people more meaningful input into the design of energy regulations, market developments and public provision – not just a wider choice of products or services.

Social innovation

If we want digitalisation to help us get to net zero, we will need social innovation as well as technological innovation, to ensure that citizens are able to shape energy digitalisation in a way that creates legitimacy and buy-in.

Community planning, citizens assemblies, and energy cooperatives are just some of the participatory arrangements that should be explored.

Because inclusive practices tend to be more commonplace in some areas of government than in others, **cross-silo meetings** with colleagues in other units can really be useful for civil servants thinking about making energy digitalisation more inclusive.

FOR EXAMPLE...

Here are some examples of cities taking a more inclusive approach to the rollout of digital technologies, or in energy or transport policy design.

Medellín, Colombia

Medellín's approach to building a digitalised Smart City was hugely successful, taking it from spiralling levels of violence in the early 1990s to its current status as a city with some of the lowest rates of poverty and crime—-and highest rates of education and health care access—in South America.

Importantly, Medellín achieved this success by prioritising smart city initiatives that were driven by the **communities** themselves, rather than technology companies. It was able to do this by pursuing various open government strategies, citizen participation, and social innovation.

Read more

Lisbon, Portugal

Portugal has taken a number of steps to loosen regulations and pass legislation that help ordinary users benefit from energy digitisation. These steps focus on making it easier for more people to **access and share solar energy**. Examples include making it easier for people to co-own solar panels with other building residents, and share electricity generated by their panels with another household elsewhere on the grid.

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ORGANISING

Citizens have some of the expertise we need

Part of the promise of digitalised energy systems is that they allow us to flex our energy use-patterns (through technology or behaviour change) and manage a more intermittent energy supply.

But it's not always easy to tell when, and in what circumstances, flexibility is a reasonable expectation of particular communities.

Citizens are experts in the household and neighbourhood dynamics, and have a clearer sense of when flexibility is possible for them and when it isn't. Bringing their knowledge and perspectives into system design is essential.

Hearing quieter voices

To get more meaningful participation in energy-related decisions, it's really important to create invited spaces where marginalised groups can safely express their interests. This can lead to better informed decision-making and action. This isn't always easy to do, especially when dealing with new technologies.

For example, digital literacy isn't always common amongst ordinary members of the public. This makes it easier for experts working for energy companies, and representing a narrower set of interests, to dominate discussions of how energy digitalisation should happen.

Being open about what you are doing is a good way to ensure you hear from more diverse people. This can be done by writing op-eds in newspapers and having a good online presence. This can bring more people into the conversation, and identify blind spots.

A more inclusive decision-making process can also produce a wide range of other benefits – like happier residents, nicer public debates and better cities.

FOR EXAMPLE...

Here are some cities or initiatives that have taken steps to ensure that even marginalised groups are meaningfully included in energy digitalisation or the rollout of other energy technologies.

Trento, Italy:

Public administrations in Trento often collaborate with **ènostra**, an energy cooperative with a strong focus on inclusion and support to local communities.

This ensures that more citizens, as members of the cooperative, have the opportunity to participate into the management and wider decision-making related to energy systems, while increasing the share of renewable energy and energy efficiency.

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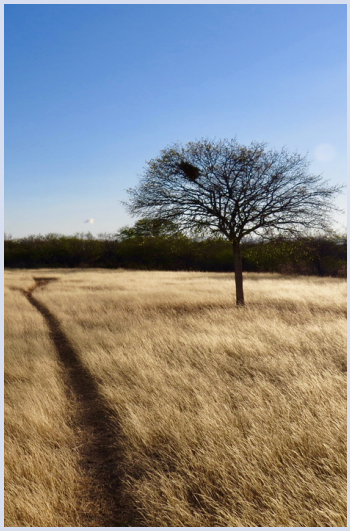
Várzea Comprida dos Oliveiras, Brazil

A Resident's Association in Várzea Comprida dos Oliveiras, a rural farming community in a drought-prone, semi-arid region of northeastern Brazil, secured funding for a **Solar Bakery Project.**

The Solar Bakery is powered by photovoltaic panels and run by a cooperative of 19 women working in shifts, in a region where women haven't always had equal access to economic opportunities.

Read more



COMMONING

A gold standard

One form of organising that generates a particularly strong form of inclusion is Commoning. The more open it is to Commoning, the more legitimate the energy digitalisation process is likely to seem to residents.

"Commoning" means making it possible for communities to collectively manage and govern shared resources or common goods. It typically involves principles like collaborative stewardship, shared responsibility, and democratic decision-making about using commonly held resources.

This sort of approach potentially fits well with renewable energies, which comes from resources we have in common – like the wind and sun.

Flexibility as a shared resource

It potentially fits very well with digitalised energy systems too. Digitalised net zero energy systems can also be understood to run on something else we share in common – our flexibility.

Seeing people's flexibility in their energy activities as a resource that is **shared among neighbourhoods** could help us generate more effective incentives than the market-based incentives currently offered to individual households.

FOR EXAMPLE...

There are no blueprints for Commoning that would work in all contexts. But here are a few social innovations that stakeholders in the energy space can draw upon.

Brighton & Hove, UK:

The **Brighton Energy Co-op** is a community-owned renewable energy project based in Brighton & Hove. It develops and operates renewable energy installations (like solar panels on local buildings, for example).

It operates on a community ownership model, which allows local residents to invest in and partly own renewable energy projects. All members have an equal vote on key decisions like project selection, and overall governance.

Read more

Zona Reina, Guatemala

Village 31 de Mayo in Zona Reina, in northwest Guatemala, successfully built and now operates a **community-owned hydroelectric plant**. This plant now provides electricity to the village and five neighbouring communities.

The hydroelectric plant has not only improved local communities' living conditions and economic opportunities. It has also empowered those communities, who actively participate in decision-making about the plant.

Read more

FOR POLICYMAKERS

Here are three steps we can recommend for policymakers working on energy digitalisation in mid-sized cities.

01

More invited spaces

Create inclusive invited spaces where diverse stakeholders can express their needs freely. They have expertise that can help.

02

Common goods

Thinking of both energy and flexibility as common goods can be a more useful framework for designing incentives that encourage the use of digital energy technologies.

03

New ideas

If possible, experiment with different ways of bringing more people into the decision-making process.

FOR CITIZENS

Here are three steps we can recommend for ordinary citizens, or activist groups, interested in these issues.

01

Get involved

Consider establishing or joining an energy cooperative.

02

Open up

If you're in an energy cooperative already, try to make it more inclusive. People have different energy needs, and not everyone is digitally literate or has time or funds to invest. More voices leads to better decisions.

03

Use your voice

Look out for opportunities to participate in decision-making about energy digitalisation. This might also involve thinking about power relations, and how you can effectively use (or expand) your influence.

ABOUT THIS RESEARCH

This research was based on the three year research project Responsive Organising for Low Emission Societies (ROLES).

ROLES studies how European city-regions can accelerate decarbonisation by digitising energy infrastructure in ways that create societal benefits.

ROLES members in 2023: Siddharth Sareen, Håvard Haarstad, Morten Ryen Loe, Sonia Gantioler, Jessica Balest, Silvia Tomasi, Nives DellaValle, Federico Voltolini, Chiara Pellegrini, Adrian Smith, Benjamin Sovacool, Marie Claire Brisbois, Gerardo Alonso Torres Contreras, Richard Flockemann

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