

IT CHANGES EVERYTHING

Issue no. 4 – October 2020

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**IS
LOCAL
BEAUTIFUL?**



Circular economy Self-sufficiency Localism

As national borders were closed to slow the spread of Covid-19, food supply chains increasingly looked to locally produced goods, enabling regional producers to sell their stock and avoid waste. It is one of the paradoxes thrown up by this crisis – **in a society where the way of life is changing beyond all recognition, whose eyes have been opened to the mirage of excessive globalisation, the idea of more locally oriented living has emerged to the public, intermediaries and leaders as a source of social and economic innovation that is well suited to respond to the social and health crisis sparked by the pandemic.**

In farming and therefore the food industry too, as well as in textiles and tourism, this commitment to a more local focus is growing on an unprecedented scale, which will undoubtedly further facilitate the emergence of a genuinely local economy.

This widely celebrated virtuous local circle must nevertheless not lose sight of the social benefit it seeks to achieve. It is particularly important when we're talking about energy resources, where continuous distribution is one of the keys to maintaining the social contract with the community. Decentralised generation must adhere to three principles: balancing energy supply with demand or aligning prices; championing solidarity, which means safeguarding supply to all; and guaranteeing acceptability for all infrastructure, in particular in rural areas.

Guided by the social benefit and these overriding conditions, the renewable energy production capacity available from region to region, coupled with the considerable potential it will unlock in terms of the circular economy, will be able to provide an effective response to the wider environmental challenge. And

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Is local beautiful?

What exactly does a local approach involve? How does it work? How is it funded? Is it really the be-all and end-all? **Béatrice Cointe (B. C.)**, sociologist and research fellow at the French National Centre for Scientific Research (CNRS), **Nicolas Ceccaldi (N. C.)**, co-founder of Futura Gaïa, and **David Djaïz (D. D.)**, author and lecturer at the Paris Institute of Political Studies, answered Thierry Keller's questions in the podcast "Ça change tout" on 16 October 2020. **Here's a quick look back at the key moments of their conversation.**



B. C.: A local approach is about **taking into account the distinctive features** of a given area or region when **organising its energy supply and system.**



B. C.: The aim is to have a certain amount of leeway in making decisions that cannot be applied directly to other areas but do **facilitate local autonomy, organisation and coordination.**

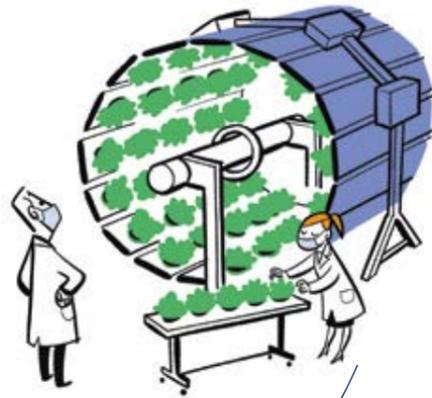


D. D.: I think we need to rethink globalisation. Yes, we should **globalise anything that requires international cooperation.**



D. D.: However, we must also regain **strategic autonomy** at European and national level in a number of **sectors that are deemed vital and could be dealt with locally.**

N. C.: We founded Futura Gaïa in response to the **global food challenge.** The best solution is sustainable outdoor farming.



N. C.: The average lettuce travels 2,500 km from farm to plate. Our aim is to provide the farming community with a solution that **enhances its ability to meet local needs.**



D. D.: That being said, we must not buy into the myth of complete self-sufficiency, as interdependence is very important. **Solidarity between French regions is absolutely vital.**



The podcast "Ça change tout" is available on all platforms and can be downloaded on Apple Podcasts, Spotify, Deezer, Podcast Addict, Google Podcasts and many more, including edf.fr.





Interview

“We are entering into a new era of cooperation and borders – two factors that will be fundamental over the coming years.”

Jean Viard
Sociologist

Sociologist and economist renowned for his work on space, regional development and youth, Jean Viard has spent his life analysing changes in society and lifestyles since his first book published back in 1978. The idea of a local orientation is at the centre of his work. In this interview, he discusses all its different facets and promises.

— Let's start at the beginning, can you define what local living is all about?

Jean Viard: Indeed, when we're talking about local living, a definition seems essential to me.

— Why?

J.V.: Because it's a concept that's rather difficult to pin down. Firstly, it's not just about geography. It covers the entire spectrum, including education, food production, family set-ups, sporting activities and community involvement – a whole variety of considerations that go into what is known as "local living". It's an area that may not be particularly clear cut, but it has a genuinely significant influence on the daily lives of us all. So we can shut down any popular preconceptions that local automatically means rural. Far from it. Self-sufficient, locally based living also exists in towns and cities, where urban populations benefit from this cooperative, community grounded way of life. To make it easier to understand, I would say the local area corresponds to the school catchment zone. That to me is the most accurate scale.

— The word "local" is being used increasingly frequently, but is it really a new concept?

J.V.: Yes and no. No, because we mustn't forget the influence of the 1968 generation, who decided to move back to the countryside, or to split their lives between their urban and rural homes to somewhat counter this rural flight. This local focus is therefore the rather belated consequence of what went on in 1968. On the other hand, yes, it is pretty new as the concept is currently enjoying a considerable surge in popularity.

— Why do you think that is?

J.V.: We are living in a globalised world, a world we are unable to control. It is important everyone is able to cultivate a more tangible, reassuring environment for themselves. But we need to avoid another misconception that local living means pulling up the drawbridge and cutting off ties with the rest of the world. Nothing could be farther from the truth. The desire for self-sufficient, community-grounded local living is about casting an anchor in the sea of globalisation rather than simply rejecting the outside world and withdrawing into isolation.

— But for years now people have been championing a blend of global and local. It's even become a buzz word for company executives and politicians. Is it really possible to achieve that blend? Are global and local not just diametrically opposed?

J.V.: I don't think so. Just look at the Covid-19 crisis. A global approach worked, and will continue to do so, in particular when it comes to conducting research or sharing information and best practice. The use

of digital technology, the ultimate tool of globalisation, has never been so widespread. Yet, at the same time, we have shut our borders and taken action at regional or local level, as we had to implement suitably adapted solutions. We are entering into a new era of cooperation and borders. I believe these two factors will be fundamental over the coming years as we strive to achieve a kind of sovereignty that's fully integrated with the rest of the world. As I've already said, it would be silly to reduce the need for local lifestyles as withdrawing into isolation. Today, thanks to digital technology, we have the tools we need to successfully connect our everyday community with the rest of the world.

— Can we allow the emergence of local living without restructuring the way local democratic institutions work?

J.V.: The two are related. But I am always a bit wary of this desire to constantly reinvent everything. There are a lot of bodies and organisations that work properly, that have a real impact in the lives of local residents, which we can leverage. I think we need to rethink the management levels. For example, we could make a real success of district set-ups by creating district councils that group together schools, healthcare facilities and public services, whereas in major cities we could do the same by borough. If you take this approach further, a city like Paris would no longer need a mayor. We could put in place a system of governance for the Greater Paris area that works in close collaboration with the mayors of each arrondissement. A local mindset shakes up the way we are used to operating.

— Your work has focused heavily on young people, the definition of this group and the way it is evolving. Is there a generational divide when it comes to local living?

J.V.: If we take a step back, we are facing a serious generational divide from all points of view. And the recent pandemic will only accentuate it further. Lockdown was intended to avoid saturating hospital reanimation services and protect people of a certain age who are more vulnerable to the virus. The next step is likely to involve a wave of redundancies that will directly affect young people. All this puts generational ties under stress. In this context, the resurgence of local community life will play a decisive role – by developing solutions to suit each local area, standardising the use of digital technology to help people find jobs and opening daycare centres in rural communities. Local initiatives provide tangible, properly adapted responses. That's why so many people are so interested in a more local approach – it will change the way we do things over the coming years.

“Local living is about casting an anchor rather than withdrawing into isolation.”

Jean Viard





LOCALISM, FROM IDEAS TO REALITY

The dictionary defines localism as “a way of life that prioritises the consumption of locally produced goods”. But the values it promotes and the current geopolitical context mean the rise of localism will lead to a considerable step change in society. Supporters of localism see it as a way to build a new kind of community cooperation.



The Covid-19 crisis has opened society’s eyes to a new way of living where people eat vegetables that were grown in the field next door, generate their own electricity and support local businesses run by the people they know. A way of living that prioritises short supply chains, “localism” is emerging as one of the solutions that best suit the challenges arising in today’s world. But what is it all about? It’s an approach open to anyone that allows them to bring about positive change in the environment, society, the economy and even politics. Everyone is able to play their part in creating a society that is more in tune not only with the natural world, but with ourselves and others too. Through individual action, localism enables each and every one of us to take back control of the direction in which we wish to take society as a whole. In the past, this sort of lifestyle was championed by mostly fringe political activists. Today, it has surpassed the theoretical debate as it translates into concrete action.

Community initiatives bring environmental commitment to life. Advocates of localism claim local consumption – whether of food or any other goods or services – leaves a lower carbon footprint as it involves less transport. Second-hand and recycled goods also travel shorter distances. Locally generated wind power and solar energy offer hope of a practical alternative to polluting sources of energy.

Another source of satisfaction for those who champion localism is that it gives people a sense of relative control over the economy. Buying “local” gives meaning to consumption. Thinking “local” fosters community spirit. After several decades of rising globalisation, which many deemed pursued too much of a financial purpose and thereby led to widespread criticism in society, public opinion has enthusiastically seized the positive nature of localism. Local consumption protects jobs, local currencies preserve global markets and short supply chains are



Localism, a modality within everyone’s reach that allows everyone to be an actor in the ecological, societal, economic and even political transition.



more secure and safer. Localism extends beyond the boundaries of a neighbourhood or a region. That is why people are keen to buy goods that have been produced domestically. National supply chains are seen as hugely positive in many industries, such as healthcare.

This movement is neither fleeting nor superficial. Arising from political debate half way through the 20th century, the intellectual arguments behind localism go back several decades and find their roots in ecological ideology. The 1970s gave rise to the well known phrase “think global, act local”, said to have been coined by microbiologist René Dubos. The French-born American researcher who discovered antibiotics was involved in the preparatory work for the UN’s 1972 conference in Stockholm, the first ever Earth Summit. Responsible for developing the United Nations Environment Programme, he considered ecology on a global scale.

His idea that people should more readily trust anything “close to home”, coupled with a general mistrust of any supra-national or overarching decision-making powers, also enjoyed widespread popularity. This antagonistic point of view had a considerable impact on all major countries, France in particular. Anything far removed arouses suspicion, including international institutions, major corporations, the government, banks and the elite in general. In contrast, what is closer to home is reassuring, such as the mayor, local businesses, artisans and local public services, which continue to enjoy public confidence and trust.

It therefore appears surprising that there is no exact definition of localism. One well-known dictionary defines the concept as “a way of life that prioritises the consumption of locally produced goods”. Yet that raises the question as to just how far this local priority extends, and where the limit lies before local becomes global. In reality, “local” means different things in different contexts. Energy self-sufficiency applies only to a single house, neighbourhood or village. Locally grown fruit, vegetables and other foodstuffs covers produce from nearby farms. Local finance is thought to span the county. These symbolic boundary lines reach right through to national borders if localism is referring to inshoring bygone industries for example.



The author Murray Bookchin (1921-2006), who inspired the New American Left, saw this lifestyle as a form of identity, an expression of individuality and a way for everyone to fit in with a society within their reach, as part of a geographical, political and social space they are able to understand, take part in and identify with.

Localism has also entered the realm of politics in France, where it is used as an argument by certain parties whose ideology appears sometimes to defend very different ideas. The term is used in an increasing variety of situations – as an alternative to globalisation, a response to offshoring or a solution to help bring about the environmental transition. Given the amount of hope it has raised, localism creates a new set of challenges for society, first and foremost its organisational structures.

Local, regional or national?

What do we mean by local consumption? In Europe, the answer differs from country to country. For 64% of people living in the EU, local means regional, according to the 2019 Cetelem Observatory, which surveyed 13,800 people across 17 European countries in late 2018 in collaboration with Harris Interactive. This regional point of view is widely shared in Germany (85%), Spain (81%) and France (75%). Further east, however, people see things on a larger scale as local means first and foremost national, which is the case for example in Bulgaria (72%) and the Czech Republic (66%). Local consumption takes on a very strong patriotic factor that motivates the purchasing decisions of a significant proportion of those surveyed. Environmental friendliness is part of the equation primarily in the west, where it drives localism for 44% of people in France, and the north, mentioned by 61% of those surveyed in Sweden. Across Europe as a whole, the main reason a person decides to buy a product based on its origin is to support the economy.

At its heart, localism reflects a number of considerations that can be categorised into two overarching domains – a drive to control the future of the region to build its environmental, economic and social identity drawing on shared values; and a way of challenging the world as its currently is.

Day-to-day commitment

8 EXAMPLES OF THE LOCAL REVIVAL

The taste for everything local is changing all the time. This symbolic commitment that blends community spirit, environmental activism and societal awareness encompasses far more than just a purchasing decision restricted to nearby production facilities, which would wrongly align it more with isolationism. Localism is practised through a multitude of wide-ranging initiatives, from the oldest form through to more modern applications – archaic, through an organised form of exchange and recognised through taxation where necessary; programme-based, where individual savings accounts are proactively invested to support projects to improve the city or region; political, whenever public authorities officially define the circular economy and include it in national targets; and global, as local currencies, environmental initiatives, neighbourhood recycling efforts and many other projects multiply across the world. All underpinned by a common desire for a better life. The following examples illustrate the many different forms localism can take on.



From the farm to the plate – the silent locavore revolution

With food baskets, regional brands and urban farms, it has never been so easy to live on a diet of vegetables grown just a stone's throw from your kitchen. Food offers a very tangible way for people to show their support for local living. It effectively meets ethical expectations and satisfies people's desire to eat "better". Short supply chains have a lower carbon footprint as they require less transport, while the direct contact with producers generates trust, builds social ties and fosters respect for natural, seasonal produce.

And the supply is there to meet the demand – according to the countryside and farming training and information association, no fewer than 70,000 farmers in France sell their production directly to consumers outside standard retail channels. A variety of set-ups exist. For example, farmers often open a shop on their property; annual revenue from these direct sales totalled €3 billion, a third of which is generated through the networks set up by chambers of agriculture called "Bienvenue à la ferme" (Welcome to the farm).

Farmers also open their own shops in retail parks. The number of these points of sale has doubled over the last six years, and now stands at nearly 400. They must comply with a certain number of requirements, for example, the farmers must themselves be present in the shop and their own produce must account for at least 70% of the total turnover.

Other formats exist, including AMAPs (farming support networks), which have sprung up throughout France. The first of these networks was set up by activists at the turn of the century, and today there are almost 2,000 such non-profit organisations that attract a more urban clientele. Customers enjoy a basket of organically grown seasonal produce prepared directly from the field. Alternatively, certain Web-based platforms offer home delivery solutions enabling customers to remotely select products from farms in the region and have their leeks and apples brought right to their door!

Local food systems serve either implicitly or explicitly to protect agriculture against major retail corporations. They cause hypermarkets to adapt. Consumers increasingly differentiate between global brands, which provoke rising levels of mistrust, and local brands, which attract ever-more interest and demand according to studies conducted by Kantar-Sofres. Consequently, major retailers are extending their ranges to include a greater number of local products.

After having developed their own local brands a few years back, they are now integrating produce grown by farmers from the surrounding area in their grocery and butchers aisles. Partnerships are multiplying and the farmers themselves, who were previously left in the wings, are being placed front and centre to create personal connections with customers. Some retailers have gone one step further and started to look into the principles of permaculture in collaboration with the farmers who practise this approach to offer their customers the most environmentally neutral products possible. Others pledge to develop urban farms in close proximity to their stores.

The countryside in town!

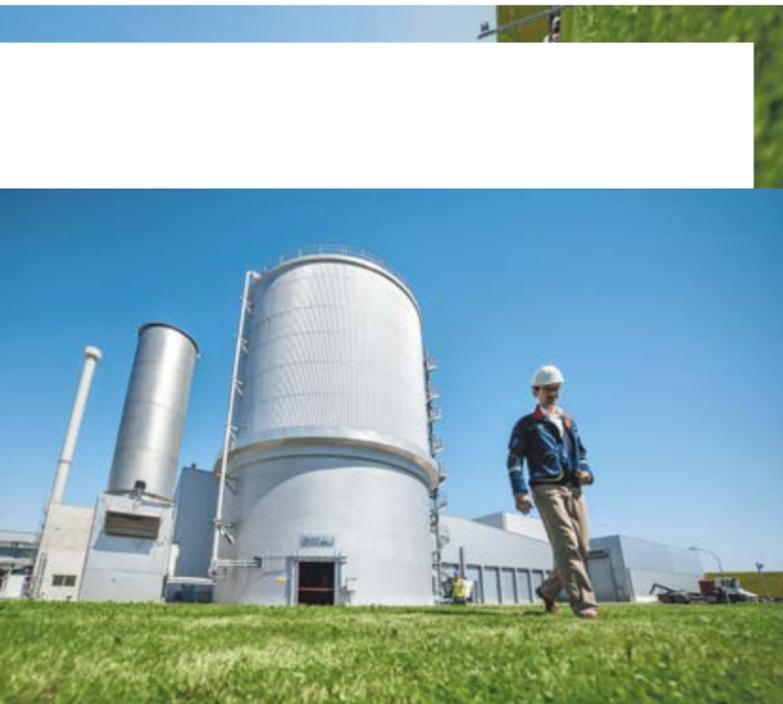
Looking for the field of watercress? Take the lift up to the fourth floor! Welcome to a realistic utopia. Vertical farms have a bright future. These innovative farming practices developed in Japan, Singapore and the United States make it possible to grow lettuce, basil and mushrooms in special buildings, across several floors without the need for chemicals and using artificial light. Several facilities have already been set up and are operating in France. Yields can be up to twice as high as those from traditional fields.



Many interested in generating their own energy

Welcome to Le Mené, a picturesque part of in Brittany where 6,000 people live in charming grey stone houses around an old manor and a beautiful lake. It was formed in 2016 by bringing together seven small villages and is pursuing an increasingly popular goal to achieve energy independence. The new district has given itself the resources it needs to make this happen, including communal wood heating, biomethanation of liquid manure, rapeseed-based biofuel, a wind farm and photovoltaic panels on the roof of the local school. Elected officials in this part of northwestern France drew inspiration from the now world-renowned Austrian town of Güssing, where biomass is used to meet all electricity, heating and transport fuel needs.

Contrary to popular belief, this kind of project is far from an impossible dream. Self-sufficiency is a goal pursued by a growing number of individuals, community organisations and local authorities, including Le Mené. There are many other examples, like in Marmagne, central France, where the "SmartMagne" project aims to meet 69% of energy needs using photovoltaic power. Or in Béganne, in the Morbihan department of Brittany, where a wind farm designed by a group of local residents generates enough energy to supply up to 8,000 people.

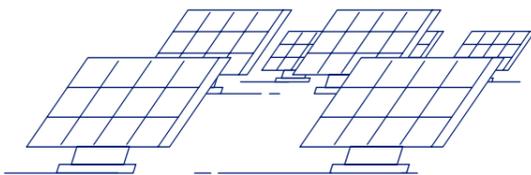


And in Saint-Étienne, east-central France, solar panels are being installed on the roofs of 150 public buildings (the equivalent of 20 football pitches). France's new regulatory framework set out in 2017 encourages projects of this kind. It provided a definition for "collective self-sufficiency" and allows the network to benefit from special tariffs.

Locally produced energy is not exactly new. In the past, it has only really been a possibility open to major cities. According to a study by France urbaine-Enedis-GRDF, facilities in Paris, Lyon and Marseille generate over 500 GWh each. The 70 largest local authorities and district councils benefit from infrastructure that allows them to generate a total 7.5 million TWh of electricity, which represents 4.6% of France's total production. They boast over 380 cogeneration gas plants, 118 facilities powered by biofuels and 65,000 solar installations. However, distributed power covers only a small proportion of urban needs (1.83 TWh in 2017).

Individuals are increasingly interested in generating their own energy. Indeed, over the last two years, the number of rooftop photovoltaic panels installed in people's homes has more than doubled, from 20,000 in 2017 to 53,000 in mid-2019. France may still be a long way off its neighbours in Germany (1.5 million homes connected) and Italy (450,000 homes), but momentum is building. The cost of rooftop installation has fallen by two thirds since 2010. According to forecasts drawn up by France's electricity transmission system operator RTE, there could be up to 4 million self-sufficient homes by 2035. In the past, a farm in the middle of nowhere had no choice but to live off its own small wind turbine. It had to generate its own electricity as it wasn't connected to the grid. Now, anyone is able to opt for this approach.

65,000
solar installations
in France.



Buying better with short supply chains

People are now able to buy second-hand clothes in large supermarkets. One leading retailer in France, Auchan, joined forces with an online second-hand clothes store to trial a range in five of its stores, and they aren't the only big name to go down this path. Some clothing retailers buy back their own pre-owned items to put them back on sale.

As it attracts more and more high street brands, the circular economy is clearly tending towards its target of zero waste. An effective way of making this dream reality is to recycle everything. Since France passed its laws on the energy transition in 2015 and 2020, public authorities have adopted this principle as their official stance. The State has set recycling targets to reach over the coming years, and will phase out single-use plastics by 2040.

Alternatively, when a telephone or a toy breaks, rather than throwing it away or ordering in a spare part, people can look to someone in their surrounding area who knows what they are doing to repair the item in question. The concept of a "repair café" was developed in Amsterdam in 2009 by Martine Postma, a staunch advocate of localism. Ten years on, there are over 2,000 repair cafés across the globe.

2020:
100%
recycling.



2040:
prohibition
of single-use
plastic.



Local currencies to add meaning to trade

The front of the 10 Brixton Pound note features the image of David Bowie as depicted on the 1973 *Aladdin Sane* album cover. It may seem surprising but this note is accepted as complementary currency in the south London borough of Brixton where the world famous musician, actor, and record producer was born. The local currency is designed to support Brixton businesses and encourage local trade and production in this area with a population of 80,000. Similar such initiatives have been introduced in many developed countries. The idea is to keep money circulating within a particular district, town or region.

In France, local currencies flourished in the wake of the 2008 financial crisis, with around 50 currently in circulation, including the eusko in the Basque Country, the doume in Auvergne and the pive in Franche-Comté. The 2014 French law on the social and solidarity economy created a specific legal framework for these currencies. Each local currency is managed by an association with support from a financial institution and can be used to pay for local goods and services. For example, it would be impossible to use local currency to pay for items bought in a national chain of stores. All local currencies are pegged to the national currency.



Nearly
50 local
currencies
in France such as...

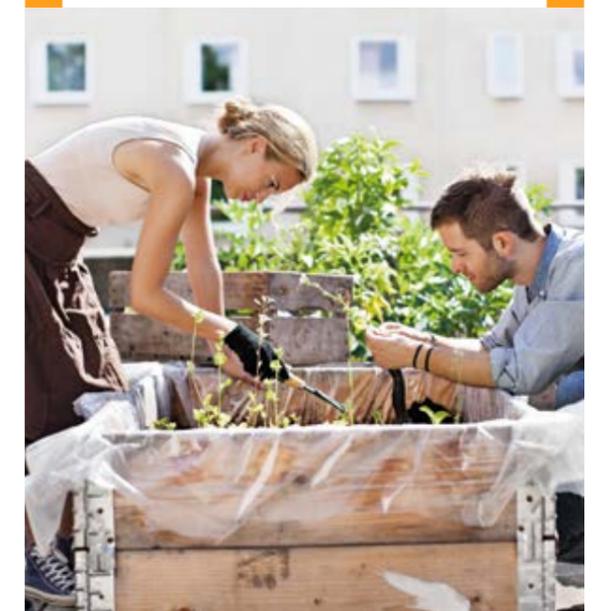
Abeille
Babet Aïga
Cassole
Boyard **Leaf clover**
Coco
Déodat Chouette
Doume Épi lorrain
Fève **Eusko**
Galais Krôcô
Léman **Maille auboise**
Muse Mana
Niep's
Paris Orai
Pêche **Pive** Ourse
Radis **Roue**
sardine
Sol alpin SOL-VIOLETTE
Tissou Tournai



A positive philosophy behind the network of "Transition Towns"

Imagine if the environmental transition was driven by local groups of people in a positive, non-party political way. This philosophy led to the creation of the NGO Transition Network, initially known in France as "Villes en transition" (Transition Towns) before it was renamed "Initiatives de transition" (Transition Initiatives). In the early 2000s, Rob Hopkins, a British activist and writer who teaches permaculture, began working with his students on the concept of "energy descent". The whole crux of the project lies in the need for people to accept that oil reserves are dwindling and seeks to understand the impact this will have on our lives. We need to draw a line under our reliance on oil and make a substantial shift in the way we live.

Hopkins believes the answer lies in community-led positive policies that foster resilience. The movement champions initiatives such as urban vegetable gardens, collective rail transport and local currencies. In 2006, the city of Totnes, in the UK, became the first official "Transition Town". There are currently around a thousand initiatives deployed throughout the world. In France, the network boasts 150 towns the length and breadth of the country. Supporters of the movement share expertise in permaculture, which remains at the heart of the approach.





Travel less, work smarter, live better

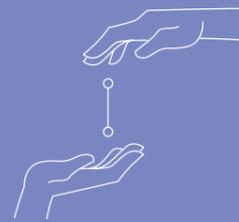
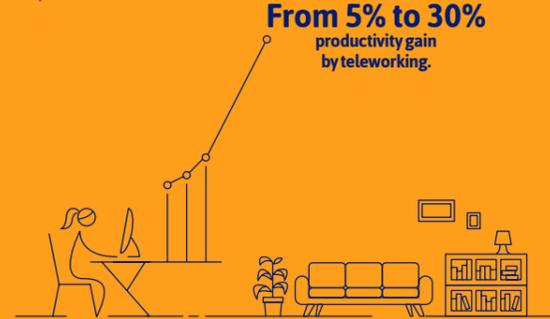
Localism goes hand in hand with the idea of living better in everyday life, such as shopping in local stores, working with local contractors, completing administrative procedures online or over the phone and avoiding the stress and lost time involved in the dreaded commute. The distance between where people live and work is also under the spotlight, especially in major urban areas. In the Paris region, the average daily commute easily exceeds a one hour round trip.

In these conditions, it would appear that enabling people to work from home offers a suitable solution in line with localism. This approach is supported by elected officials in urban areas across the entire political spectrum. When people leave their cars in the garage, they reduce pollution due to congestion and ease pressure on transport networks.

Working from home also encourages people to eat either at home or in their local area, which, according to a study conducted by the French Ministry for the Economy, helps to boost productivity by anywhere between 5% and 30%. Another survey identified a positive effect on family life most of the time.

The impact needs to be explored further on a larger scale, because less than 2% of employees regularly or occasionally work from home. During the Covid-19 pandemic, an estimated 12 million people in France were able to work from home.

From 5% to 30% productivity gain by teleworking.



CES
Community exchange system

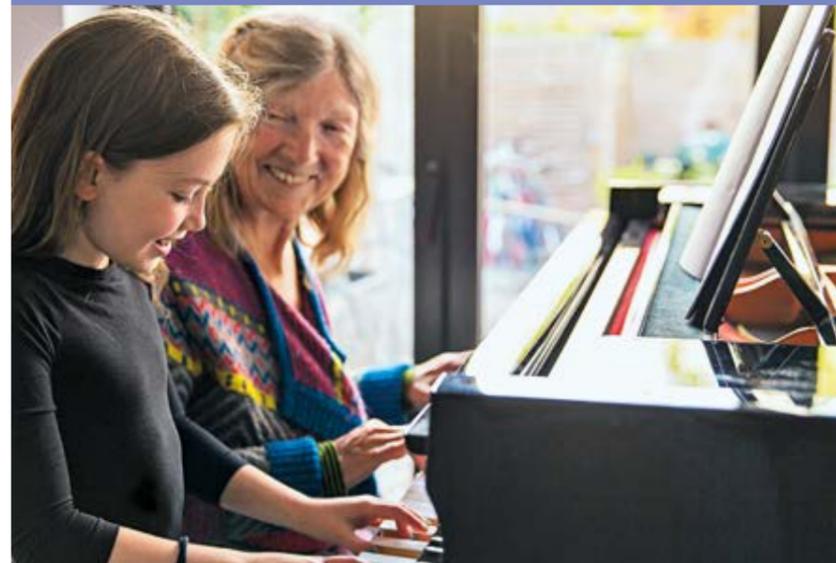


600 CESs
referenced in France

Trading goods and services between neighbours

Community exchange systems (CESs) don't require the use of regular money. People can trade their time or expertise for another service of equivalent value within a formally structured community network; for example, they could enjoy an hour-long piano lesson in return for an hour of gardening. CESs are non-profit organisations and there are currently around 600 operating in France. Each system defines its own unit of measurement that serves as a recording mechanism to keep track of values as they are transferred, which is different from any conventional "currency". This could be time, where an hour spent helping someone around the house is worth an hour of any other activity, as is the case in Caen, or a mutual credit system like in Paris. These transactions aren't taxed; no-one pays VAT or social security contributions, but if the service forms part of a regular exchange, or if it can be considered as part of a person's job, it must be properly declared.

The first modern CES in France was set up in 1994 in Ariège. The following year, a national network was created.



Local crowdfunding

Where might an entrepreneur find the money they need to open a shop in a near-deserted village? Or to renovate a landmark building no longer in use? Or even produce a music video for an unsigned artist? Local crowdfunding is a way of raising money that injects meaning to investment. Building on the success of standard crowdfunding, such initiatives have sprung up all over the place, driven by non-profit organisations, businesses and local authorities. For example, in Corrèze, in southwestern France, over 50 projects have been developed through voluntary contributions from local residents, from school trips worth a few hundred euros to investments of over €100,000 to restructure the meat industry. Elsewhere, the Pilat natural regional park in southeastern France kickstarted the creation of a soap factory, a cheese shop and a tourism centre.

Local crowdfunding can also be organised by charities and start-ups, such as the platform Tudigo, which supports 1,300 small businesses. Across all categories, record levels of investment were made through crowdfunding in 2019 – €629 million, having surged 56% in just one year.

This model has even permeated the world of renewable energy, where the number of local crowdfunding campaigns to develop new wind farms or solar parks is growing considerably – proof that people are keen to invest in tangible ways of driving the energy transition in their community.



Crowdfunding: €629 M in 2019



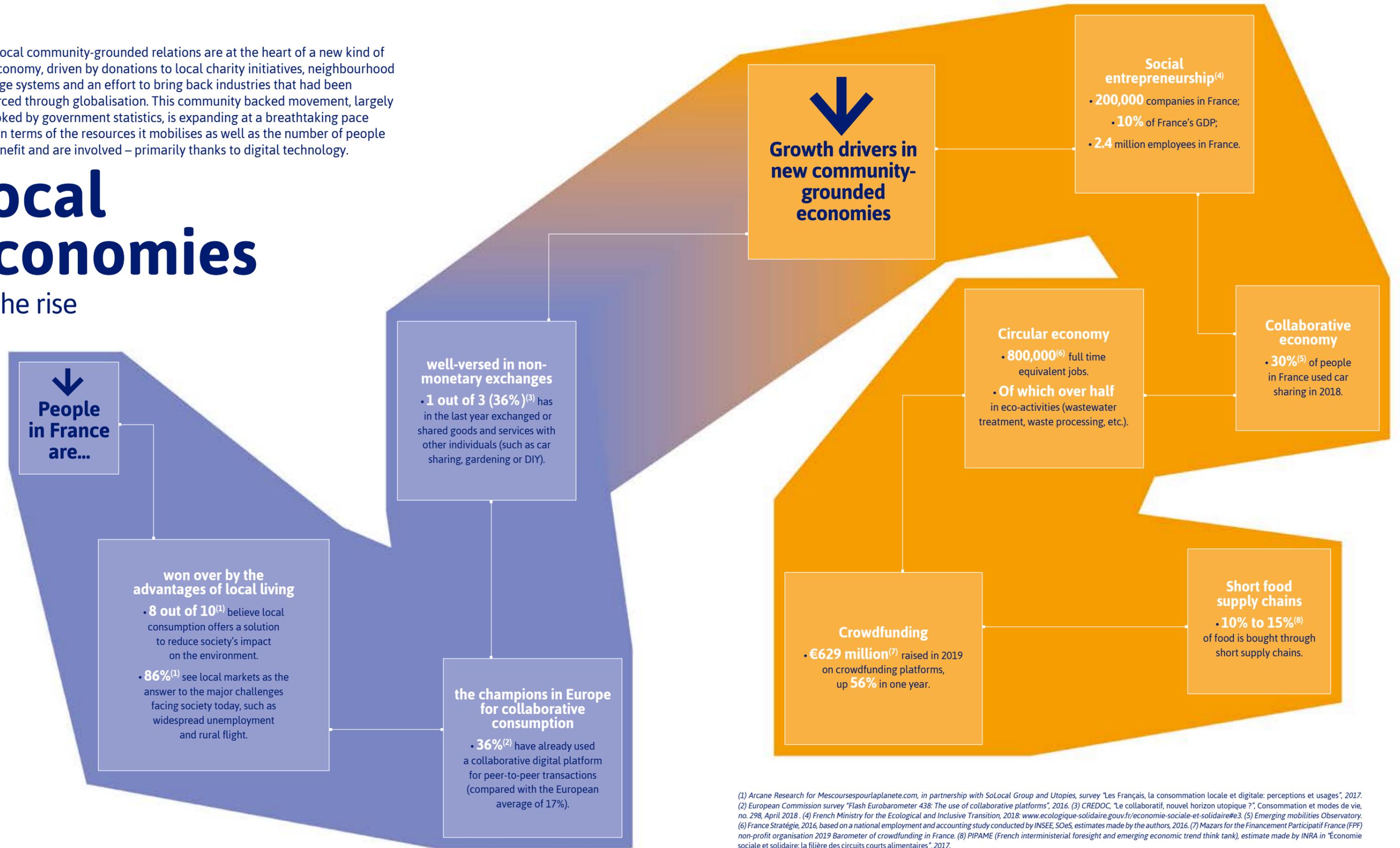
Up 56% vs 2018



Direct local community-grounded relations are at the heart of a new kind of local economy, driven by donations to local charity initiatives, neighbourhood exchange systems and an effort to bring back industries that had been outsourced through globalisation. This community backed movement, largely overlooked by government statistics, is expanding at a breathtaking pace – both in terms of the resources it mobilises as well as the number of people who benefit and are involved – primarily thanks to digital technology.

Local economies

on the rise



(1) Arcane Research for Mescoursespourlaplanete.com, in partnership with SoLocal Group and Utopies, survey "Les Français, la consommation locale et digitale: perceptions et usages", 2017.
 (2) European Commission survey "Flash Eurobarometer 438: The use of collaborative platforms", 2016. (3) CREDOC, "Le collaboratif, nouvel horizon utopique?", Consommation et modes de vie, no. 298, April 2018. (4) French Ministry for the Ecological and Inclusive Transition, 2018: www.ecologique-solidaire.gouv.fr/economie-sociale-et-solidaire#e3. (5) Emerging mobilities Observatory. (6) France Stratégie, 2016, based on a national employment and accounting study conducted by INSEE, SOeS, estimates made by the authors, 2016. (7) Mazars for the Financement Participatif France (FPF) non-profit organisation 2019 Barometer of crowdfunding in France. (8) PIPAME (French interministerial foresight and emerging economic trend think tank), estimate made by INRA in "Economie sociale et solidaire: la filière des circuits courts alimentaires", 2017.



Interview

“Localism needs to create resilient communities and bring about social change.”

Arthur Keller

Specialist in societal vulnerability and resilience strategies

As a trained aerospace engineer turned specialist in societal vulnerability, Arthur Keller is working on the resilience of our societies. He carries out in-depth analysis of the emerging trend for localism, rejecting clichés and trends to take into account the real considerations behind the revival of locally oriented lifestyles. Read on for his answers to our questions.

— Localism is an idea that has become increasingly popular in recent times.

Arthur Keller: Oh really?

— Wouldn't you say so?

A. K.: It is indeed growing, but it's still a very new, fledgling movement. The real interest lies in looking behind the word, identifying what is really going on.

— And what do you find when you do that?

A. K.: Opposing visions of the world. Behind the dream of localism, there are several major rifts that structure public debate in today's society. The first division lies between people who always want more and those who simply want a good quality of life where they are. The second division is between carefree, self-congratulatory people who, on principal, are confident about the future and believe in the omnipotence of human ingenuity and technology, and those who realise our model has limits and understand that, to guarantee supply chain security, we need to build autonomous local economies that are not dependent on the other side of the world for vital supplies (on that note, check out the *Next Web* series episode titled "Collapse: the only realistic scenario"). The third division lies between settled people, who are tied to a region by their job or social status, and the nomads – those who aren't held back by borders, whose resources allow them to live and work anywhere. The nomads think they can get away with not worrying about disturbances in the world right now, as they can move about as they please – for the time being – to live wherever suits their activities best. There is a fourth division, essential in my opinion, that separates those with a utilitarian view of the world, and those who believe that we have a duty to take care of it. The first group shamelessly uses all available resources, while the second group tries to be more respectful of their surroundings. However, we take even greater care of the delicate balances in the natural world – which our supply of raw materials is dependent on – when we use resources from our own regions (collaborative management of the commons). Behind the quest for localism, these fundamental rifts are emerging locally and globally, but limiting our analysis of the issue to these two levels is a simplistic approach.

— What other levels are there?

A. K.: I break it down into six – individual (the person, the household), collective (a village or district), community (a small town, local authority, major urban area, catchment area or department), regional, national and supranational. There are separate political, economic and civic structures within each different level.

“It is time the State empowered local elected officials and acted as a facilitator of community transformations.”

Arthur Keller



— Are these six levels completely separate, each operating autonomously within itself?

A. K.: Absolutely not. We must not view these levels as separate but rather as parts of a whole. All the levels are important and most people will not come out on top if there are no clear links between the different levels as part of subsidiarity approach, whereby anything that can be managed or produced locally should be, starting with anything vital – particularly food production and distribution, energy, health security and public safety.

— But what do you think is the most effective level for most people to tackle the challenges we face today?

A. K.: Considering almost nobody has direct power to make changes beyond their community, I think that each individual's concrete action in their spheres of influence, i.e. at the local level, is highly important. In no way does this prevent them from trying to do all they can to influence decisions made higher up – there are effective tools and ways of mobilising to do so, people just need to get more involved. The community level is important because it helps bring about tangible change, make decisions that reflect local issues and resources, and invigorate genuine democracy. That is actually why it is time the State empowered local elected officials and acted as a facilitator of community transformations. However, not all communities have the same assets or needs; they therefore need to start coordinating with one another to streamline and rebalance the flow of energy and materials. The local level and higher levels should not be viewed as separate – I really feel the tendency to oppose everything is one of the biggest problems in today's world.

— Why?

A. K.: Setting them against one another is often subjective, ideological, simplistic and counter-productive. It is now vital to focus on the system and collaborate rather than compete with each other. Today, people are facing a real dilemma, as their sphere of interest has grown to encompass the planet as a whole – on issues such as climate change in particular – but their sphere of action is much smaller, and citizens and decision-makers are always readily set against each other, with each group suggesting it is up to the other to change. However, in reality, we are all responsible for our own involvement and we can only prevent the complete destruction of all living things (including humankind) by taking action on two fronts. First, by lobbying political and economic decision-makers in every possible way to reduce the flow of energy, resources and pollution at the international level, and by imposing severe penalties on people who do not put all their efforts into doing so. Second, by changing communities to make them resilient to any systemic shocks by regenerating nature and reducing the negative effects of all activities and consumer choices on the climate, biodiversity and social cohesion. It is possible to choose alternative ways of living that are respectful of all living things and are simple yet fulfilling, then use solid indicators to demonstrate the merits of this change, and lastly illustrate it with inspiring actions that could trigger transformations in other communities in France and further afield.

GLOBAL SYSTEMS IMPROVING LOCAL SYSTEMS

Arising from the criticism levelled at globalisation, localism pursues environmental and social progress that has garnered widespread support in public opinion. To achieve this progress, coordination at a higher level is required. The energy industry accurately reflects this situation.



KEY FIGURES⁽¹⁾

- **23%**: the proportion of electricity consumption covered by renewable sources in 2019 in France.

- The proportion of electricity consumption accounted for by local renewable energy sources varies from **42.3%** in the south-eastern Auvergne-Rhône-Alpes region to just **1.6%** in the Greater Paris region.

- **48%** of renewable energy production capacity came from solar or wind power in 2019, which is now equivalent to hydropower.

- **21.3%** and **7.8%** growth of electricity generation in wind and solar, respectively, in 2019 in France.

Both a way of life and a way of thinking, localism offers a widely appreciated answer to the expectations of our current era. Local initiatives are thought to help bring about the environmental transition so highly sought after, build a sense of community and give meaning to consumption. But the priority given to proximity implicitly asks questions of the community as well as the organisational and decision-making bodies on which it is built.

At national level, localism reveals the inequalities that exist between regions and the people that live there. First and foremost from a geographical point of view. In energy, the potential of photovoltaic, wind or hydropower can vary considerably between different areas. For example, normal wind strengths can be three times weaker in the woods of eastern France than over the pebbles of the Normandy beaches.

This same geographical struggle also affects localism in food production. Country plains, mountain regions and sedimentary basins don't all offer the same opportunity for growing crops and raising livestock. Climatic conditions and natural resources also vary. So what meaning can a nation have while it presents such disparate energy and food profiles?

Economic inequalities also exist, alongside considerable gaps between social class and personal assets, which represent a further challenge to a properly localist society. In some parts of the country, people would have the necessary resources to invest in their local economy, but in other more disadvantaged areas, they simply wouldn't be able to. There is an evident risk of iniquity. In a way, fanatically striving for local living could lead to a contradiction of certain principles contained within the republican pledge.

So then how can we design local projects yet still ensure equal access and constant supply across an entire region or country? How can we mitigate gaps between scarcely and densely populated areas? How can we ensure that people's expectations are met and their rights are respected?

The energy industry demonstrates the way in which coordination can provide satisfactory answers to these questions. Initiatives are multiplying, bringing increasing numbers of people to the table. Local authorities are promising progress to their electorates, while housing associations launch projects and architects, property developers and businesses start on their own path to transformation. It is essential to maintain a certain level of harmony overall, both to ensure balanced systems and optimise investments. In terms of territorial authority, EDF believes that the region represents the most suitable level at which to implement local projects. The Group's expertise enables it to define a regional strategy and encourage cooperation between councils and private operators.



(1) "2019 Panorama of renewable electricity".

◆ Global systems improving local systems



EDF and Enedis actively support such initiatives by harnessing their technical expertise to identify the solutions that best suit the blend of local resources and needs of the district or town, connect a positive energy building to a heating or electricity network and enable incineration plants to supply heat to an entire neighbourhood.

At national level, public authorities have set a shared framework to ensure the social benefit of each initiative. Indeed, the Energy-Climate law voted in November 2019 sets a target for France to reduce its use of fossil fuels by 40% by 2030 compared with 2012 levels. In this way, local action has a decisive role to play. It is by its very nature the level best suited to implement renewable energy projects with wind, biomass and photovoltaic power. In return, local authorities pursuing self-sufficiency receive technical and financial support from the state.

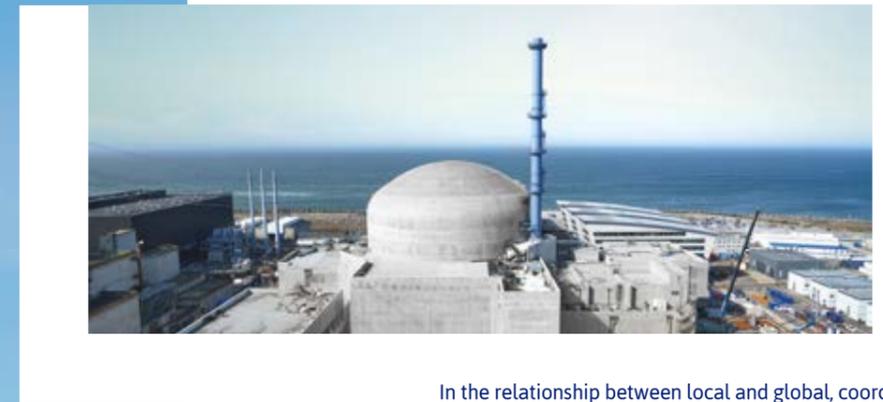
Furthermore, EDF and Enedis help secure the existence of these local projects through the power and reliability provided by their own infrastructure. The largest nuclear power plants and renewable energy production units (hydropower in particular) boast capacity that safeguards supply for all, equally, at all times and at the same price, everywhere throughout the country to all communities of every size. A nationwide guarantee.

At the same time, the network operator ensures the balance between generation zones and consumption zones, right up to European level. It should be noted that no community becomes truly self-sufficient; even large urban areas consume more energy than they generate. That is why inclusive initiatives at varying different levels – community, national and continental – complement initiatives on the ground. In a way, global systems are there to improve the local system.

The interconnection between the different scales is crucial when it comes to energy and other areas. Local currencies also offer another striking example of this relationship. By definition, currency is a vector of both trust and sovereignty. People exchange bank notes that they all agree symbolically recognise the right of the bearer to receive the amount indicated, which requires them to trust in the system. Local currencies draw heavily on this definition, especially highlighting the goal of sharing. It is a textbook case of a group of people who actively share the same idea and personally commit to achieving their common objective, one of the requirements at the heart of the consensual contract of society.

Currency also represents sovereignty. Its value must be underwritten by an authority that represents the community beyond its borders, it must be recognised outside its territory and it must be able to be converted into other currencies. It is the European Central Bank that fulfils this role for the euro. Local currencies respect the official rules in force within the eurozone, enabling them to circulate. Again, effective coordination is essential for effective and harmonious coexistence.

When it comes to food, the quest for environmental friendliness also reflects a similar situation. In a report published in 2017, the French environment and energy management agency (Ademe) recommended effective coordination between supply chains of different sizes. It estimated that the diversity of short supply chains “doesn’t systematically guarantee lower environmental impact than long supply chains”, contrary to popular opinion. Indeed, two thirds of CO₂ emissions generated by food systems is related to the production itself. Transport accounts for less than 20% of greenhouse gas emissions in the industry. The carbon footprint of exclusively local food consumption is relative and depends considerably on the vehicles used to travel between the field and the place of purchase.



In the relationship between local and global, coordination is the absolute key. The anthropologist Marc Abélès formulates this idea very effectively, without opposing the two spheres. In his book on the anthropology of globalisation, published in 2008, he writes: “globalisation is a fabric of interactions that is possible to be apprehended in localised sites”. Similarly, Bernard Pecqueur, specialist in geography, believes that “local development holds the keys to effectively adapt to the new global context”. That is because this overall approach makes it possible to ensure the solidarity, balance and viability of local projects while respecting the initial aims and political principles of the country.



The EDF Renewables subsidiary is responsible for a significant share (excluding hydropower) of the Group's target to double its installed capacity of renewable energy between 2014 and 2030 to reach a total of 50 GWe. In 2019, EDF picked up the pace of these efforts, doubling its wind and solar capacity under construction (to 4.4 GW). In France, the Group is the leading producer of offshore wind power and has already secured 2,000 hectares of land to build ground-mounted solar power plants.

LOCAL RENEWABLE ENERGY

powered by the community

The Energy-Climate law voted in November 2019 sets a target for France to reduce its use of fossil fuels by 40% by 2030 compared with 2012 levels. To successfully bring about the energy transition, we need to harness all available renewable energy sources. Local action has a pivotal role to play to make this happen.

Onshore **wind power** generated 7.2% of electricity consumed in 2019. By 2028, the installed capacity of onshore wind turbines will have nearly doubled, and greater attention will have been paid to ensuring their acceptability. Furthermore, recent technological progress will also increase the number of hours during which they are able to operate at maximum capacity, which currently stands at around 25% of the time.

Boosted by generation conditions nearly twice as favourable (operational 40% of the time) thanks to strong and constant winds, offshore wind will begin its commercial development from 2022 off the French coast in the English Channel and the Atlantic Ocean.

As the country with the fifth largest potential for **solar** power generation in Europe, France is keen to take advantage of this source, which accounted for only 2.5% of electricity consumed in 2019. To more than double photovoltaic generation capacity by 2023, France's Energy-Climate law made it mandatory for solar panels to be installed on newly built warehouse, supermarket and carport projects. The new 2023-2028 multi-year energy programme (PPE) also promotes competitive ground-mounted solutions, with a view to multiplying solar capacity by five over the period.

Marine energy is less mature in terms of generative technology but is the focus of targeted development efforts. France enjoys the most powerful ocean currents in the world and tidal demonstrators are already in operation, in particular off Ushant island. French overseas territories offer considerable potential in ocean thermal energy, which produces energy by harnessing the temperature differences between ocean surface waters and deep ocean waters.

To respond to the challenge of developing urban heating and cooling systems, France is looking to at least quadruple (between 2017 and 2028) the amount of heat generated using deep **geothermal** energy, which offers excellent yields (95%).

The French government is aiming to double the number of geothermal heat pumps (which transfer heat from the ground or surface water) used to heat people's homes by 2023, compared with 2017 levels. Of all the different heat pump technology, these pumps offer the greatest efficiency and also provide an alternative to air conditioning.

As the leading primary source of renewable energy in France (accounting for 78% of renewable heat generation in 2017⁽¹⁾), **biomass** nevertheless remains a rare resource, which is why it must be used in areas where the energy recovery is most effective. Wood is used mainly to generate heat and biogas is transformed into biomethane, a renewable gas.

Using these materials to produce energy boosts the circular economy if they could not be avoided as waste or otherwise recovered. The circular economy objectives set out by the French Energy Transition for Green Growth Act⁽²⁾ reorients such flows up to 2025 to enhance energy efficiency. Optimising waste energy recovery from **household waste** incinerators is also a priority.

The largest source of renewable electrical energy, **hydropower** still harbours 5% of unexploited power, which can be tapped into through the development of small plants of less than 12 MW in size. Both predictable and manageable, hydropower is essential to complement intermittent sources like wind and solar.

(1) French Data and Statistical Studies Department (SDES), Chiffres clés des énergies renouvelables, 2019 édition. (2) 2015 Energy Transition for Green Growth Act. Sources: PPE, April 2020 and "2019 Panorama of renewable electricity", joint publication by RTE, the SER renewable energies syndicate, Enedis, ADEEF and ORE, the energy network operators agency.

This technology uses the thermal energy of seawater to control the temperature in buildings using heating and cooling systems. It has no impact on local biodiversity or the environment.

MARINE ENERGY

Loops that provide heating and air conditioning



Up to **4 kWh** of heat rendered for every **1 kWh** of electricity consumed.

1,800 tonnes of CO₂ avoided every year in La Grande-Motte.

Already extensively developed in Nordic countries such as Norway, marine energy represents a highly profitable source of renewable energy that can be used in dense urban areas. This flexible, versatile energy enables the simultaneous production of heating and cooling and is gaining traction with local authorities along the Mediterranean coastline, where the absence of tides makes it easy to put in place pumping systems. Indeed, a project has recently been launched in La Grande-Motte, on the south central coast, and the networks in Marseille, Sète and La Seyne-sur-Mer are being extended.

As in Marseille, the town has created circular economy loops within the network to further reduce energy usage. Indeed the heat generated by air conditioning is recovered and reinjected back into the network.

Air conditioning winning over collective home ownership groups in La Grande-Motte

In August 2019, La Grande-Motte awarded Dalkia, subsidiary of EDF, the concession for its future marine energy network. By 2022, around 30 buildings in the town centre will be connected to the new network, representing the equivalent of 3,100 homes, which will avoid 1,800 tonnes of CO₂ every year and cut energy bills for customers by 5%. To make a suitable level of return on such major investments, it is important to bring the customers on board and ensure they buy into the approach by underlining the environmental and financial benefits, of course, but also the added comfort. In older collectively owned buildings where it is impossible to install air conditioning units on the facade, this low carbon cooling solution using seawater is just the ticket.

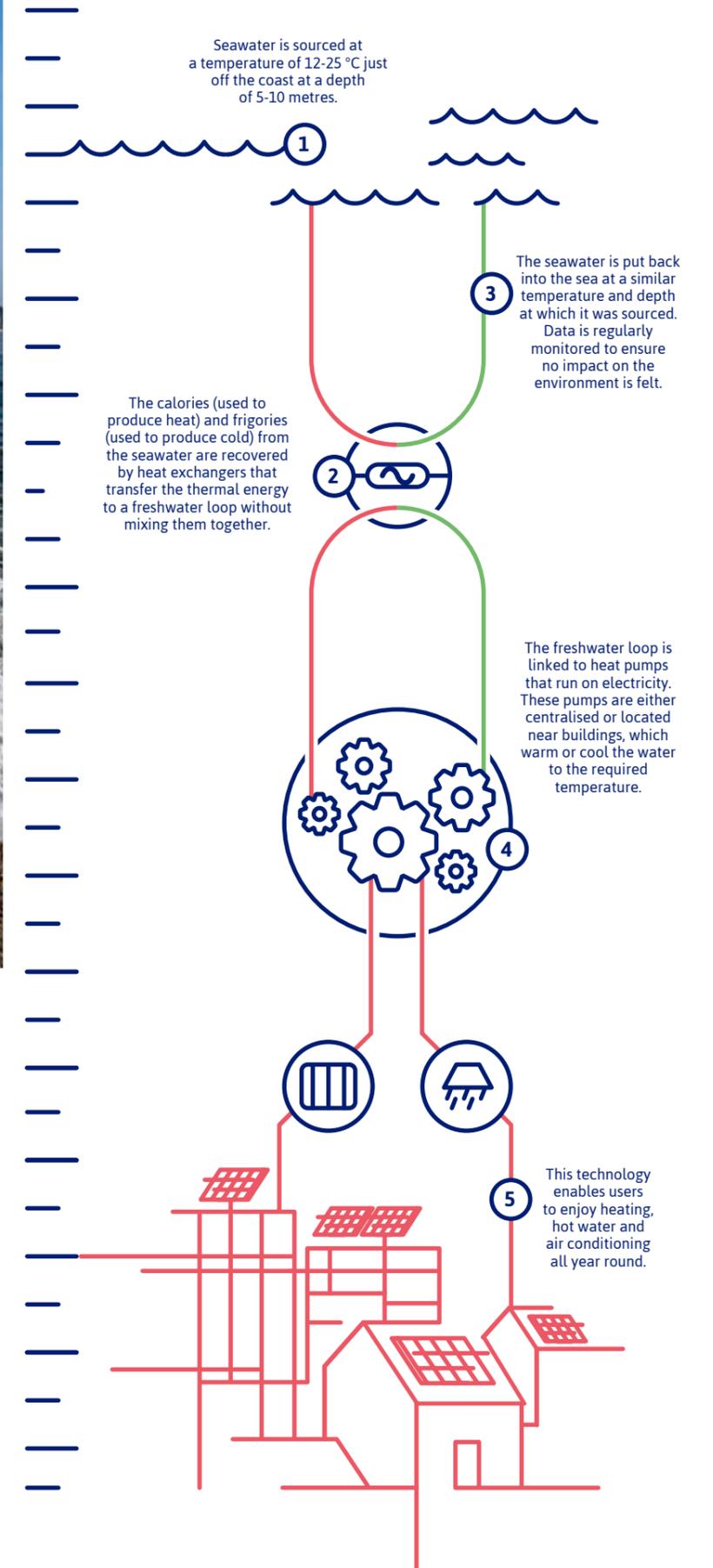
Setting the standard in Monaco

Spearheading the movement in the 1990s, Monaco was the first to enter into marine energy. The decision was driven by its ability to integrate the power source into the city's urban development plan and was designed to minimise its energy dependency. Today, the principality boasts over 70 marine energy facilities, which generate 17% of its thermal energy. This large-scale experiment has enabled specialists in marine environments to confirm the technology has no adverse impact on the natural surroundings. Soon after, many other towns started to follow suit. Sète was the first town in France to adopt marine energy technology in its aquatics centre. Marseille already heats nearly 2,500 homes using seawater. And La Seyne-sur-Mer has been harnessing marine energy for the last eight years to supply heat to 30,000 m² of homes and 14,000 m² of office and retail space.



“Here in La Grande-Motte, the Mediterranean has for decades helped us attract tourists and enabled us to enjoy water sports. Now, it also provides a source of profitable, clean and sustainable energy.”

Stéphan Rossignol
Mayor of La Grande-Motte and
Chairman of the Agglomération du Pays de l'Or





At local level, energy recovered in particular from waste and industry that would have otherwise been unused represents an increasingly powerful tool to drive forward the energy transition.

Energy recovery OFFERS ENORMOUS POTENTIAL FOR THE CIRCULAR ECONOMY

What is energy recovery?

Widely available throughout the country and inexpensive to recover or reuse, energy recovery complements the use of renewable energy to accelerate the energy transition locally. Energy can be recovered from a variety of sources:

- **waste heat**, which is heat that is generated as a by-product of some other activity, such as industrial facilities, tertiary buildings (including data centres and waste water), household waste energy recovery units, household waste incinerators and other waste facilities. Waste heat is injected into urban heating systems or used to produce electricity and heat through cogeneration;



- **non-recyclable household waste** can be reused to produce electricity or steam for urban heating or industrial uses;
- **biogas**, which is obtained in France primarily from agricultural waste, animal excrement, organic household waste, sewage sludge and industrial effluents. It is recovered through methanation, a technique that reproduces a natural biological process that breaks down organic material anaerobically using bacteria. Purified biogas, which is also known as biomethane, is reinjected into the natural gas network or can be used as vehicle fuel (bio-NGV).



In Toulouse Métropole, the future 36-km heating and cooling system will be connected to 15,000 homes using energy 70% powered by heat from the local waste incinerator and monitored by supercomputers from a research institute. This process avoids discharging some 19,000 tonnes of CO₂ into the atmosphere, the equivalent of the emissions from 9,000 cars. In Dunkerque, Boulogne-sur-Mer, Perpignan and Dijon, many such systems are already operated by local authorities that are seeking to reuse recovered energy and household waste available in the local area to heat their communities or produce electricity or steam for other industrial uses, creating local circular economies.

19,000
tonnes
of CO₂ less in the atmosphere
due to recovered energy.

Expanding urban heating and cooling systems

Heating and cooling systems, which are profitable in densely populated areas, are well positioned to take full advantage of energy recovery. The French Energy Transition for Green Growth Act seeks to multiply the amount of renewable and recovered energy delivered by five by 2030, compared with 2012 levels. To reach this target, towns and cities need to pick up the pace of their development. That is what is happening in Toulouse as well as Lyon, which is installing France's first "green" heating system. Heating and cooling systems are no longer reserved for major cities. The responsibility to bring about the energy transition shared by regions and industries is now being harnessed to implement long-term local circular economy strategies.

Local socially beneficial solutions

In this new landscape of energy recovery to serve the community, the as yet untapped potential of waste heat from industry, household waste processing facilities, purification plants and data centres is considerable. In 2017, it equalled 12.3 TWh⁽³⁾ near already existing urban heating systems, including 56 potential production sites that alone totalled 9 TWh. Beyond the cost of installation, the issue today resides primarily in contractualising the energy transfers between various local bodies – local authorities, businesses and manufacturers.

(1) PPE, April 2020. (2) 2019 survey of heating and cooling systems, conducted by the French national syndicate of urban heating (SNCU). (3) Ademe, "La chaleur fatale industrielle", 2017 edition. This figure quantifies the amount of waste heat above 60 °C.

Heat accounted for **42.3%** of final energy consumption in France in 2017...

... 21% of which was produced using renewable or recovered energy⁽¹⁾.

781 heating systems in France at end-2018 (5,781 km)...

... supplying the equivalent of **2.42 millions** homes⁽²⁾.

Cooling systems spanning a cumulative **202 km** at end-2018 delivered **1.05 TWh** in thermal energy.



In France, 6% of homes are already heated using urban heating systems. Energy recovery solutions are helping to develop these networks and make them greener.

PSA and Charleville-Mézières

A MUTUALLY BENEFICIAL HEATING SYSTEM

In Charleville-Mézières, the foundry operated by car manufacturer PSA had always been known as the largest private-sector employer – providing 1,790 jobs – in the north-eastern Ardennes department. Since January 2019, it is also proud to harness its waste heat to heat several districts of the town with a population of 48,000, the local hospital and a number of public buildings, representing the equivalent of 3,290 homes.

A 10-year contract with the car manufacturer

The journey started back in 2016. The local authority is looking to triple the size of its heating system, extending it from 3 km to 8.9 km, and especially make it greener by moving from a full gas energy mix to over 50% renewable energies. Tasked with this public service project, Dalkia made contact with the local PSA Peugeot Citroën facility. The EDF subsidiary conducted an energy audit two years earlier that identified a potential waste energy source of 28 GWh at between 300 °C and 400 °C. The project immediately seduced the manufacturer, which, keen to reduce its environmental impact, signed a ten-year contract with Dalkia.

To implement the heat recovery system, an internal network of exchangers was fitted at PSA. To supplement the sources feeding into the urban network, an 800-kW biomass boiler was installed, along with a cogeneration gas boiler that operates in winter. In 2028, it will be replaced by a second biomass boiler. The local population is now able to access heat from a renewable, less expensive source than in the past, as energy recovery can be produced at a much lower cost than conventional energies. Energy bills are therefore about 15% lower, equal to approximately €300,000 of savings per year for the hospital. Dalkia monitors all the buildings connected to the system in real time, which makes it possible to intervene rapidly and correct any anomalies of excess consumption.

3,290 equivalent homes heated by over 60% renewable and recovered energy.



A heat pump that maximises the use of waste heat

In Ghent, in Belgium, a portion of the heat produced by the town's cogeneration plant couldn't be used as it was too low in temperature to supply the urban heating system, which runs at 105°C in winter. Through its research and development efforts, EDF and Johnson Control designed and installed a heat pump prototype that increases the temperature of available heat sources up to 120°C. The heat recovered is then reused in the urban heating system, representing an additional yield of 3%.



7,000 t
of CO₂/year avoided,
the equivalent of the emissions
from almost 4,000 cars.



Local renewable energy →

THE WASTE ENERGY RECOVERY UNIT IN FIGURES

- 50,000 trips to the recycling centre each year.
- 1,000 tonnes of compost in 2018.
- 34,000 tonnes of steam for the desalination plant.
- 3,500 m² of photovoltaic panels fitted on the roof of the facility.



The waste energy recovery unit sorts, recycles or recovers waste by category:

- recyclable waste (paper, steel, glass, etc.) is packaged and sent to special recycling channels in the United States;
- non-recyclable waste is transformed into energy. Burning this waste produces the heat (23,500 MWh) required by the island's desalination plant, which produces 3/4 of its drinking water;
- Green waste is composted and used as fertiliser for the island.

ST. BART'S IN FIGURES

- 25 km².
- 10,000 inhabitants.
- 300,000 visitors each year.



St. Bart's

AN ISLAND THAT RECOVERS ALL ITS WASTE

Upgraded last year, the island's waste energy recovery unit now processes all industrial and household waste in a circular economy system.

The island's residents and businesses produce

19,000 tonnes of waste per year.



Servers generate a lot of heat that needs to be evacuated. Instead of letting this energy go to waste, it can be recovered and recycled to heat buildings or be injected into a heat system.

Data centres HUNTING OUT HOT AIR

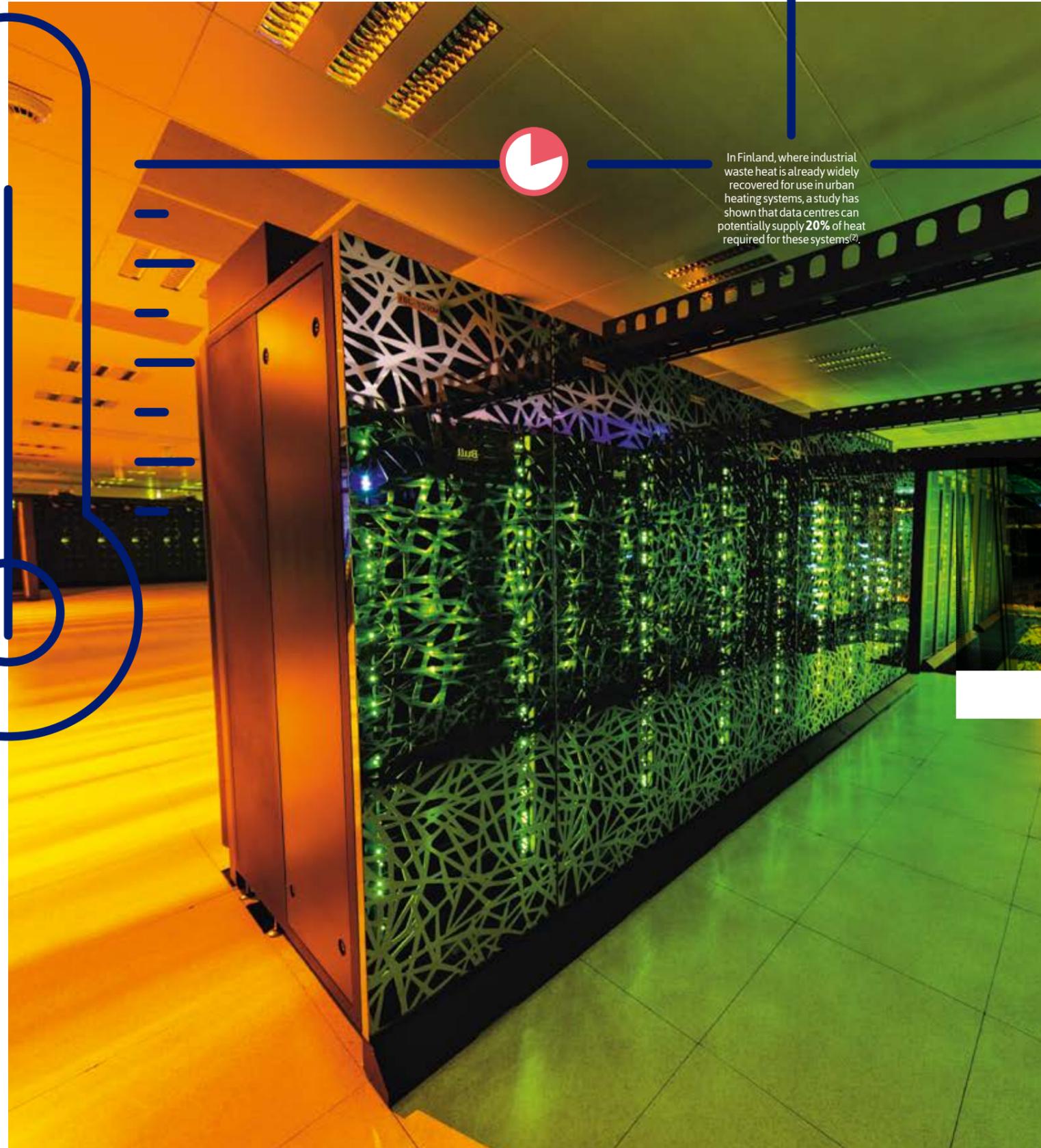
Servers give off such a considerable amount of heat that 50%⁽¹⁾ of the electricity used by a data centre goes to powering its cooling systems. That is why some major digital companies have decided to set up their facilities in Nordic countries to take advantage of natural air conditioning using the cold air. Where there are systems nearby these data centres that require constant heat production (like a public swimming pool, greenhouse crops or an urban heating system), another solution is to recover and redirect this heat. In 2012, the Val d'Europe aquatics centre south-east of Paris was among the first places in France to adopt this approach, working in partnership with the data processing centre of a bank. Ever since, other local loops of this kind have been put in place.

Recovery rates still too low

A report published by Ademe in 2019⁽²⁾ acknowledged that too few projects actually come to anything due to financial or technical constraints. These obstacles could be avoided by anticipating the integration of data centres in energy planning right from the construction phase. Stockholm's "Data Center Parks" programme is held up as an example as it combines energy, digital and real estate strategies. Since 2016, digital infrastructure operators have been offered long-term leases and free cooling services in exchange for the right to recover the waste heat, which is injected into the district heating system.

The report also identified several ways communities and data centres could work together on energy projects locally. The redundant equipment installed in data centres, such as the back-up power source, which often runs on fuel oil, could be put into use as a shared resource. Of course, that would mean abandoning batteries and fuel oil generators for a source of energy with lower emissions. The places home to data centres could also take advantage of their considerable need for electricity to develop joint solar or wind energy projects, as they already do in the United States. In any case, there is an urgent need to take action as the expansion of digital infrastructure is only going to continue!

(1) Cécile Diguët and Fanny Lopez, L'impact spatial et énergétique des data centers sur les territoires, Ademe report, 2019. (2) Mikko Wahlroos, Mätti Pärssinen, Samuli Rinne, Sanna Syri, Juka Manner. "Future views on waste heat utilization – Case of data centers in Northern Europe", Renewable and Sustainable Energy Reviews, volume 82, part 2, February 2018. (3) Les Echos Solutions, Data Centers en France : les enjeux pour 2020, December 2019.



In Finland, where industrial waste heat is already widely recovered for use in urban heating systems, a study has shown that data centres can potentially supply 20% of heat required for these systems⁽²⁾.

Dalkia, an EDF subsidiary, works with around 80 data centres to supply its customers with low carbon heat.



200 large digital plants are currently operating in France⁽³⁾.



A digital boiler

Many service sector companies reuse the heat generated by their data centres for their own needs. For example, the Air France facility in the Alpes-Maritimes department, in south-eastern France, is used to heat 8,500 m² of office space. Using the same idea, the French tech start-up Tresorio worked with Dalkia, a subsidiary of EDF, to develop a digital boiler where the servers are installed directly within the buildings they are intended to heat. Since July 2018, a pilot model has been helping to heat the domestic hot water at the Mercy hospital, in Metz-Thionville. This digital boiler solution will also be used to preheat the pools at the Olympic Aquatics Centre in Saint-Denis that will host the swimming events at the Paris 2024 Olympic Games.

80%
of methanation projects are headed by farmers or involve organic farming matter.



A substitute for gas formed from fossil fuels, biogas also presents a number of social and economic advantages as its localised production fits within a circular economy approach.

Biomethane FARMING IN THE VANGUARD

Overlooking the farmland surrounding the small town of Senlis, in northern France, the biomethane plants and their recognisable domes are nothing like traditional gasworks. Nevertheless, these bio-digesters produce 200 m³ of renewable gas every hour, primarily from natural substrate mix (such as high-concentration energy fibres, beetroot pulp and dry wheat grain). Reinjecting into the natural gas network, this production supplies heat and hot water to around 2,000 homes. The four farmers responsible for setting up this facility demonstrate the recent interest the world of agriculture has shown in producing biomethane, which comes from purifying biogas. This approach is supported by the Government, which prefers to direct biogas into the gas network rather than use it to generate electricity, due to the significant gap in yields⁽¹⁾. In 2018, 713 GWh⁽²⁾ of biomethane were injected into the natural gas network, 1.8 times more than the previous year. At end-2018, 76⁽²⁾ such facilities were in operation, representing a total capacity of 1,218 GWh per year.

Avoiding setting aside specific land

There are many positive reasons to further develop biomethane – including to secure additional sources of revenue, become self-sufficient, reduce the carbon footprint of farms and play a part in bringing about the energy transition – which also help to achieve the target set in the French PPE to generate 7% of gas consumed in France from renewable sources by 2030. However, it is important to avoid setting aside land specifically for the purpose of methanation, as they do in Germany, the world's leading producer of biomethane, so as not to penalise food production. In France, methanation makes use of unused waste and residues (see page 33) rather than any product grown specifically for this purpose. Indeed French law limits such practices to 15%.



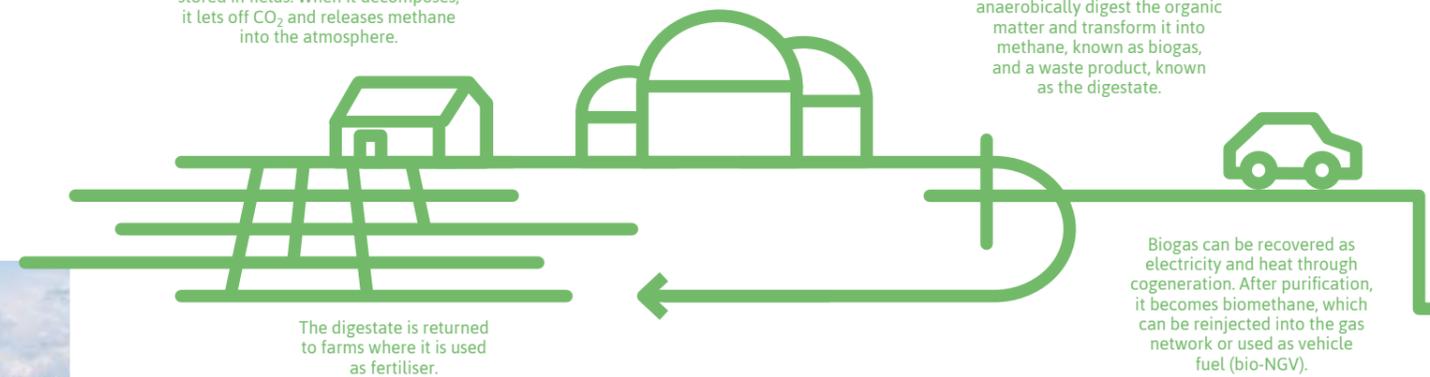
In France, target to generate 7% of final gas consumption from renewable sources by 2030⁽³⁾.



Methanation reusing manure

When it remains unused, manure is stored in fields. When it decomposes, it lets off CO₂ and releases methane into the atmosphere.

In a biomethane plant, bacteria use the heat (38 °C) to anaerobically digest the organic matter and transform it into methane, known as biogas, and a waste product, known as the digestate.



The digestate is returned to farms where it is used as fertiliser.

Biogas can be recovered as electricity and heat through cogeneration. After purification, it becomes biomethane, which can be reinjected into the gas network or used as vehicle fuel (bio-NGV).

(1) The energy yield of a biomethane plant is estimated at 94% when injected into the natural gas network, but this figure drops to around 35% when it is used to generate electricity. Source: French PPE. (2) SDES, Chiffres clés des énergies renouvelables, 2019 édition. (3) French PPE, April 2020.



Collective self-sufficiency

SHARING ENERGY BETWEEN NEIGHBOURS



In 2019, **90%** of connection requests or declarations of photovoltaic projects made to the bodies that manage the electrical distribution network involved either individual or collective self-sufficiency projects.



16

collective self-sufficiency projects are in operation in France, and around 100 are under development (figures at end-Q2 2019).

The possibility for communities living in the same building or district to collectively generate and consume their own short supply chain renewable energy is an increasingly popular way people are choosing locally to consume less and better. It also offers regions the opportunity to reach energy autonomy in the future.

Technological progress made on photovoltaic panels (lower costs and enhanced performance), electricity storage and consumption monitoring tools have made collective self-sufficiency genuinely achievable. This process can be put in place by local authorities, social housing developers, collective home ownership groups, educational establishments or businesses. The only condition are that the group forms a legal entity and that their scope of intervention must be geographically limited. It is a way for people to take back control over environmental action and for local authorities to maximise the use of locally generated energy. Ultimately, the aim is to achieve the highest possible rate of self-sufficiency.

For now, the emerging practice doesn't allow users to become fully independent from the electrical grid. Living entirely "off the grid" would mean not only having considerable generation and storage capacity, but also requiring systems to maintain sufficient voltage and frequency, which is difficult to achieve alone. That is why almost all people who generate and consume their own energy alternate between their own source and the grid, sometimes even reinjecting any surplus energy back into the network.

But collective self-sufficiency is developing fast. Firstly, the legal framework (see below), although recent, will soon extend the scope of this electricity sharing to neighbours within a 20-km radius. This will make it possible to more easily combine buildings with complementary consumption patterns (tertiary and residential for example) to optimise the rate of self-sufficiency. Furthermore, blockchain technology will also make it easier to manage energy transactions between different participants. Local or regional energy markets could be formed, on the condition of course that if this local surge spreads tariffs are aligned nationally.



Legal framework

The decree of 24 November 2019 completed the July 2017 legal framework governing energy self-sufficiency. The main provisions include:

- 2 km: maximum distance between two sites in a single collective self-sufficiency programme;
- all transfer points of a single operation must be located downstream of the same medium to low voltage public electricity transformer substation;
- 3 MW: total generation power that cannot be exceeded in mainland France, which represents the equivalent of approximately 3 hectares of photovoltaic panels. In island areas that aren't connected to the mainland electrical grid, cumulative maximum power is capped at 500 kW.

Furthermore, as energy generated by individuals is transferred to the low voltage public grid, those involved in collective self-sufficiency programmes must continue to contribute to the maintenance and upkeep costs of the network. They are therefore not exempt from paying tariffs for the use of public electricity networks (TURPE) delivery costs.

3 MW

Total generation power that cannot be exceeded in mainland France.





The Rochebelle housing block in Alès, southern France, is currently the largest collective self-sufficiency project in France. Since May 2019, 100 tenants consume the electricity they themselves generate.

Rochebelle – Alès

SPOTLIGHT ON HOW COLLECTIVE SELF-SUFFICIENCY WORKS IN PRACTICE



Key figures

Equipments
600 m² of photovoltaic panels fitted on the building roof.

Generation
1,200 to 1,300 kWh per year.

Objectives
– Meet 20% of energy needs for each household and a significant majority of needs in the 5 communal stairwells.
– Consume 100% of power generated on-site.

Savings for participants:
€100 annually for each household.

Partners
Social housing developer Logis Cévenols, Ademe, EDF group, Enedis and the Occitanie regional council.

“The algorithm used in Rochebelle and the automated steering of the hot water cylinders used for storage apply machine learning. That is why we are predicting electrical self-sufficiency to improve over time, from 16% to 21%, which represents an additional €5,000 reduction in the overall electricity bill.”

Benjamin Declas
CEO at EDF ENR

“As a social housing developer, Logis Cévenols has long focused on minimising service charges, especially for communal areas. Photovoltaic production does just that.”

Philippe Curtil
Deputy CEO at Logis Cévenols,
social housing developer

Optimisation

This project is striving to consume 100% of power generated on-site, meaning that it will not reinject electricity into the public grid, to reduce tenants' electricity bills as much as possible. Every kilowatt generated must be able to be stored. In Rochebelle, EDF uses the hot water cylinders fitted in each home, which are programmed to store surplus electricity produced during the day by heating the water. The Group's R&D department is testing an innovative algorithm to steer the hot water cylinders to better synchronise the building's generation and consumption.

Distribution

In addition to the algorithm developed by EDF's R&D department, the steering system helps to more fairly distribute the photovoltaic production between all tenants, based on the size of the apartment in which they live.

Improvement

Collective self-sufficiency also requires those involved to improve the way they consume energy. An app allows each tenant to monitor their energy use, and gives advice to help them adapt their consumption to suit generation forecasts.





Interview

“The resurgence of the local mindset stems from people’s willingness to take practical steps to regain control of their immediate surroundings.”

Mathilde Woillez

Geographer and regional planning and development specialist

Mathilde Woillez, a geographer and regional planning and development specialist, has worked in diverse settings such as Brittany and Greece, as well as rural and suburban areas. She believes that concrete action, innovation and democratic vibrancy take shape at local level. Read on for more details.

— Does the current need for local living not show that people want concrete solutions to “take control” of their reality?

M.W.: There is no doubt about it. I would even go as far as saying that there is a real need for hands-on democracy. The best example that comes to mind is mayors, who enjoy a truly special status in France, because you can talk to them, question them and be in direct contact with them. It has become very difficult, verging on impossible, to do so with MPs and even more so with ministers. The resurgence of the local mindset stems from a similar idea: people’s willingness to take practical steps to regain control of their immediate surroundings.

— And yet many challenges nowadays seem to be on a global scale. Where do local communities fit in?

M.W.: Jacques Delors propagated the idea of a “Europe of the Regions”, in which local authorities addressed global challenges but on a much smaller scale. This highly relevant vision shows how interlinked the two levels are. Localism is about achieving autonomy, not isolation. Under no circumstances does it involve being cut off from the rest of the world and it is not meant to be a stand-alone approach. On the contrary, it forms part of a much broader, national policy. This makes it an invaluable crucible of innovation.

— How do you explain this ability to innovate?

M.W.: Necessity is the mother of invention. The rural exodus in the 1970s severely affected countryside areas, leaving many villages almost deserted. Much imagination and innovation were therefore needed to bring these regions back to life right in the middle of the thirty-year post-war boom, when society was fuelled by unprecedented economic growth. This taught local people, businesses and organisations how to fight, move forward and come up with solutions. This is why they are often very well prepared to carry out projects and come up with concrete answers to complex situations today.

— In what areas can a local approach prove particularly effective?

M.W.: Definitely when it comes to food, a vital topic that is directly linked to local roots. Or energy, which can be generated by individuals as well as local authorities. For instance, at the end of the 2000s, many local authorities chose biomass to heat public buildings. Decisions like these are easier to implement locally. The same goes for waste management, with an increasing number of solutions being developed. Not to mention culture, which is growing more and more dynamic with the help of local associations. Of course, all these sectors are inherently linked to the subject of employment. There is no point in giving an idyllic, distorted overview. Most job opportunities are still located in cities, but the local

sphere also has a part to play. Firstly, local areas create jobs that technology will find hard to replace (algorithms cannot cover all aspects of agriculture, culture, waste management, etc.). Secondly, professional lives are evolving across the board and are becoming less tied to specific locations. As the recent Covid-19 crisis showed, remote working is on the rise and people will now be able to live “locally” and work “globally”. There was a rural exodus in the past, maybe there will be an urban exodus in the future.

— But is there not a risk of inequality inherent to the local revival? Seeing as regions do not all have the same assets, could some of them not lose out overall as a result of localism?

M.W.: I think that view of the situation is distorted for one fundamental reason: regions come into being as a result of humans interacting with their surroundings. Each region therefore boasts very specific assets. The countryside and outer and inner suburbs all have potential that can be unlocked. Pinpointing this potential and unleashing it are the complicated part.

— How can that be achieved?

M.W.: Historically, France has a centralised administrative system. We therefore need to distance ourselves from this legacy, while acknowledging what it has given us. The crux of successful local empowerment lies in the approach: it is vital to get local stakeholders and residents on board because they are in a better position to detect challenges and come up with suitable responses. This dialogue-focused approach will help drum up support for projects. Of course, it takes more time and sometimes it is more difficult. However, in the long run, it ends up being more effective, which in turn improves the quality of democratic life.

“A local approach fosters innovation.”

Mathilde Woillez



ISLAND REGIONS WITHOUT ELECTRICITY

Are they set for greater energy autonomy?

Not only are local recovered energy and renewable energy part of the low carbon transition in non-interconnected islands, they promise emancipation from fossil fuels. EDF is supporting these regions in their transformation.

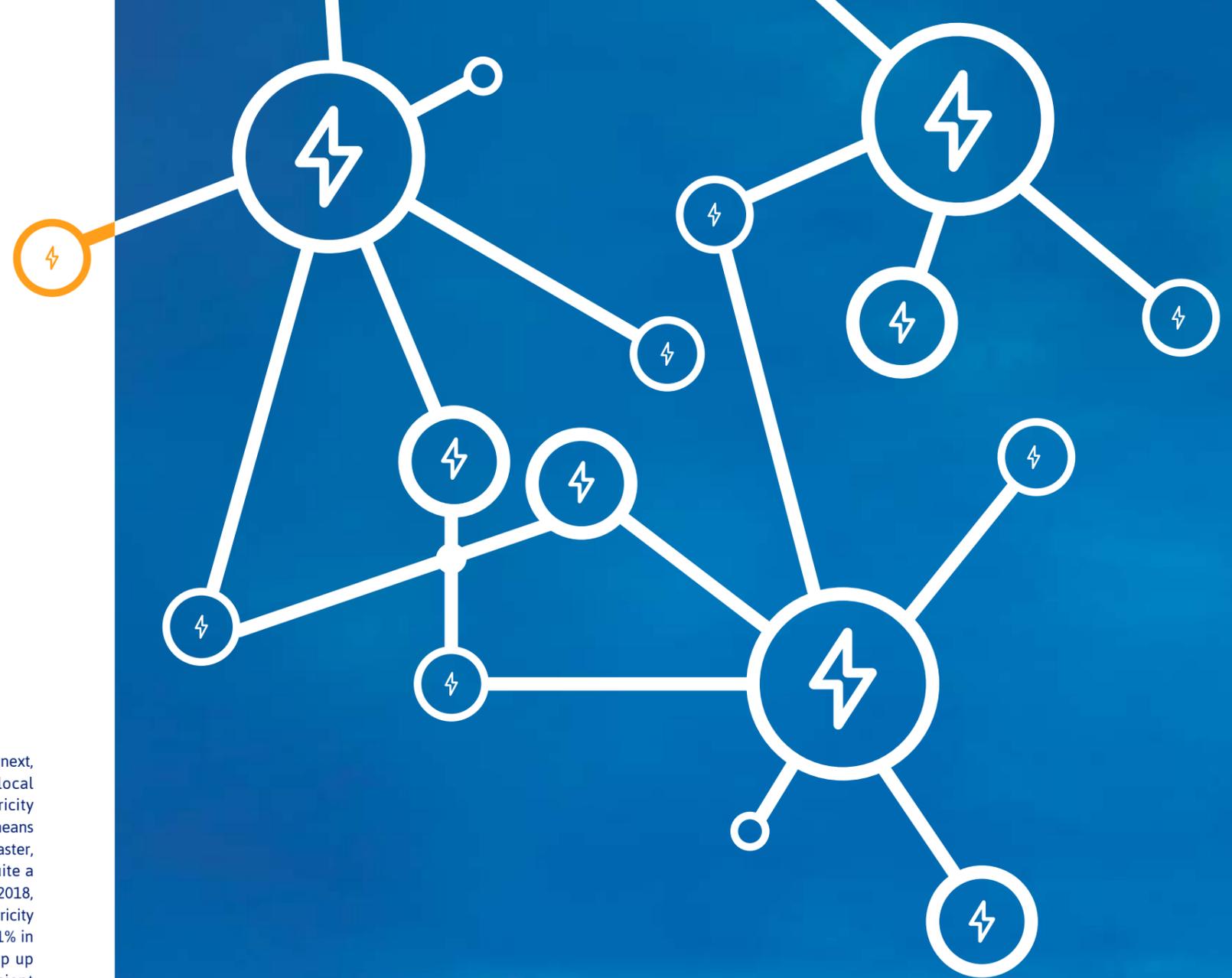
In France, non-interconnected islands refer to parts of the country that are not connected to the mainland electricity grid (or have a partial connection in Corsica's case). These include overseas departments and regions (Guadeloupe, Reunion Island and Mayotte), some territorial authorities (Martinique and French Guiana) and overseas authorities (Saint-Martin, Saint-Bart's, Saint-Pierre-et-Miquelon, and Wallis and Futuna), the Anglo-Norman island of Chausey, the Ponant islands (Sein, Ushant and Molène) and Corsica.

Non-interconnected islands are a laboratory for energy transition

In 2015, the Energy Transition for Green Growth Act set an ambitious goal for French non-interconnected islands: renewable energy must make up 50% of their energy mix by 2020 and they must achieve energy autonomy by 2030 (2050 in Corsica's case). Against a backdrop of diverse contexts and local resources, innovative solutions are being developed for each specific region to make this ambition a reality. These include 100% renewable energy-based microgrids in French Guiana and Brittany, the development of complex algorithms to optimise the use of renewable energy production, the installation of 5-MW batteries in the French West Indies and on Reunion island, the implementation of a smart charging network for electric vehicles and vehicle-to-grid testing in Corsica, not to mention the energy-saving programmes with no equivalent in France. Non-interconnected islands took their constraints and turned them into an excellent driver of the energy transition.

Sufficient resources but many challenges

Though resources vary greatly from one region to the next, non-interconnected islands appear to have enough local renewable energy potential to meet their entire electricity demand. Nonetheless, the 2030 goal of energy autonomy means that new renewable energy sources have to be deployed faster, which will be difficult in such a tight timeframe. It is quite a challenge and the cost has not yet been worked out. In 2018, renewable energy sources accounted for 36% of total electricity generation on Reunion island, 21% in Guadeloupe and 11% in Martinique. Alongside this, it will be necessary to ramp up electricity consumption management, develop efficient mechanisms to ensure the stability of the electricity system, invest in network and storage infrastructure and start making the switch to an electric vehicle fleet.



Regular walkers would not recognise the place without the whirl of the generators installed at the bottom of the big lighthouse on the western tip of Sein island. They might not realise it, but there is more to this than meets the eye – or ear. On this cloudless May day, solar power has fully replaced the oil-fuelled power plant, providing electricity to this 195-resident island that is not connected to the mainland energy grid.

Sein island is a laboratory for ENERGY TRANSITION



“When the weather is nice in the summer, we are able to switch off the three generators for several hours at a time,” said Dominique Salvert, the island’s former mayor who has supported the project. “Photovoltaic panels and storage batteries take over, saving 60,000 litres of fuel oil every year. The island produces around 15% of its own electricity, but this is just the beginning.” In 2017, photovoltaic panels were installed on all roofs on the island, which is barely 2 km long and between 30 to 500 m wide. First they covered the hatchery at the bottom of the lighthouse, then the watersports centre, the fire station, the ferry terminal and so on. In total, this amounts to nearly 1,000 m² of solar panels that can generate almost 140 kW of power.

Storms and the encroaching sea as catalysts for change

Residents of this small island have installed rainwater collection tanks in their courtyards, which serves as a reminder to visitors that nothing goes to waste on the island. Incidentally, electricity is also used to desalinate seawater. A boat brings food supplies over from the mainland once a day, weather permitting, which has taught generations of Sein residents to live frugally. “Electricity arrived on the island in the 1950s,” recalled Yves Fouquet, an island dweller. “We were almost totally isolated up to that point. Ever since then, we have adopted a more sensible approach to electricity consumption in a bid to minimise our carbon footprint.” The rationale behind harnessing Sein’s natural resources – the sea, the wind and the sun – to make the island autonomous in terms of electricity dates back to 2008, following a particularly rough storm. Every year, the sea is chipping away at this tiny island, which has an average altitude of under 1.5 m. And the thought of the generators continuing to release 1,200 tonnes of CO₂ into the atmosphere every year was becoming harder and harder to swallow.





Step one: reduce electricity consumption

The island has been dreaming big ever since: Sein's goal is for 50% of total electricity generation to come from renewable energy sources by 2023 and 100% by 2030. This collective project is spearheaded by the town council in conjunction with EDF's island energy systems division, the Ponant islands association, the region of Brittany and local stakeholders. Herein lies a serious challenge: renewable energy sources will have to meet large fluctuations in electricity consumption throughout the year if they are to become a permanent replacement for fuel-oil generators. Not only on winter nights, when there is no wind or sun, but also during the busy summer period, when electricity consumption jumps from 60 kW to 450 kW.

"Sein was the first area in France to use LEDs for all public lighting," explained the former mayor. The council's first action was to reduce the island's electricity requirements. "Today, our 90 lighting points use about as much electricity as an oven. We can manage each one separately. They start out at 20% brightness in the evening, increase to 80% brightness when it is pitch black out, then dim when the streets are empty," he said. Financial and technical support from partners has facilitated other energy efficiency initiatives since 2010: thermal insulation for houses, the replacement of 180 cooling units, as well as the replacement of the reverse osmosis system, which uses 50% less electricity to produce drinking water.



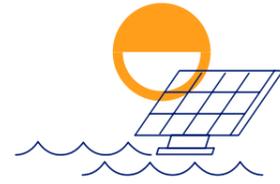
Storage and smart management
EDF has been supporting the Ponant islands in their energy transition to 100% renewable energy since 2016. Étienne Radvanyi, EDF engineer and specialist in electric microgrids, tells us about the solution developed for Sein island:

"In order to be able to harness photovoltaic output and manage self-sufficient buildings on the island, while continuing to ensure all households have a secure supply of electricity around the clock, €1 million has been invested in overhauling the electrical system. Two major technological innovations have been rolled out as a result of a collaboration between our R&D teams and our subsidiary EDF Store & Forecast. The first solution is a centralised energy storage system that stores excess photovoltaic production and releases it when demand is high or there is no sunlight. The second innovation involves a microgrid that enables the smart management of the electrical system by adjusting the various sources of production and storage remotely, thereby optimising renewable energy use. Its fully autonomous software manages and coordinates photovoltaic production, the use of batteries and other available demand response mechanisms 24/7."

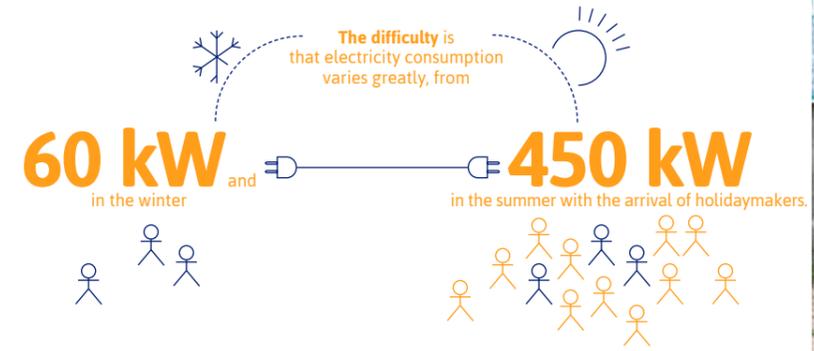
Étienne Radvanyi
Engineer

Solar energy today, wind energy tomorrow

Extra photovoltaic panels will help Sein meet 20-25% of its electricity needs. The forthcoming addition of a medium (250 kW) wind turbine, a third of the size of those built on the mainland, will help Sein produce 60% of its own electricity. Peak production does not always coincide with peak consumption; therefore, the use of hydrogen to store energy for longer is also a promising prospect for greater autonomy. Marine energy, which has enormous potential, was once under consideration in Sein but is not currently on the table as the technology was deemed to be not mature enough yet. However, marine turbines and wave energy converters could make significant progress by 2030. One thing is for sure: Sein residents' fierce determination to make progress is far from depleted.



The goal is for **50%** of total electricity generation to come from renewable energy sources by 2023 and **100%** by 2030.



Discover the sound documentary in the podcast "Ça change tout", on all listening and downloading platforms: Apple Podcasts, Spotify, Deezer, Podcast Addict, Google Podcasts... and on edf.fr.



SEIN ISLAND IN FIGURES

2 km

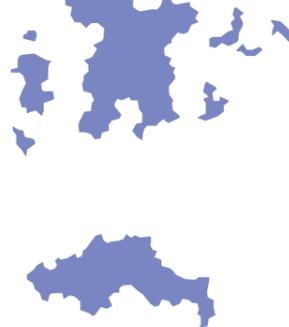
long by 30 to 500 m wide



Average altitude: **1.5 m**

15 Ponant islands in action

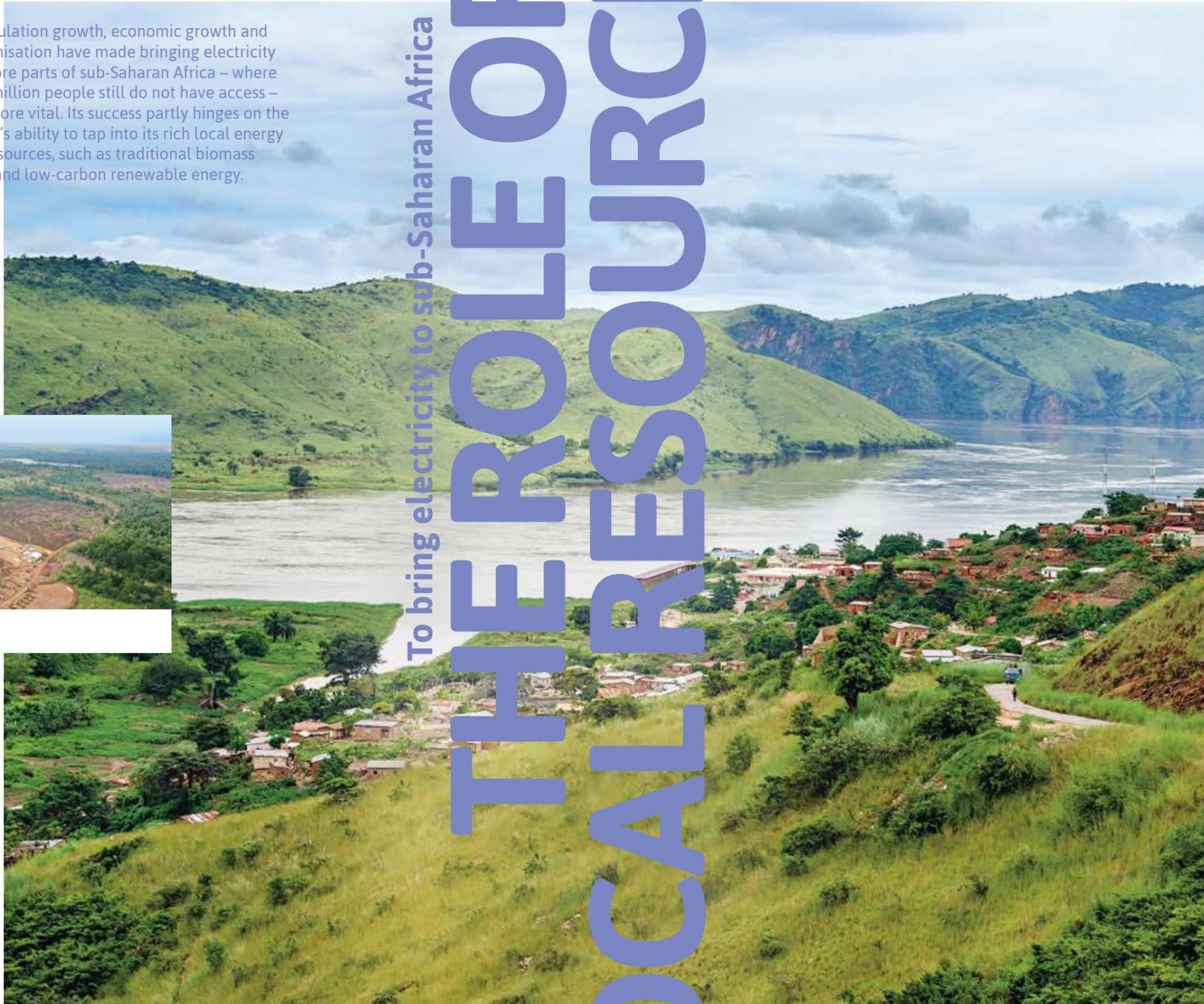
The Ponant islands are a group of small French islands dotted along the coast in the English Channel and the Atlantic Ocean, 15 of which formed an association. In 2015, like Sein island, the Ponant islands that are not connected to the electricity grid (including Ushant, Molène and Chausey) embarked on an energy transition to achieve energy self-sufficiency by 2030. Their fossil fuel-based electricity generation produces 13 times more CO₂ than the national grid does.



Population growth, economic growth and urbanisation have made bringing electricity to more parts of sub-Saharan Africa – where 600 million people still do not have access – even more vital. Its success partly hinges on the region’s ability to tap into its rich local energy resources, such as traditional biomass and low-carbon renewable energy.

To bring electricity to sub-Saharan Africa

THE ROLE OF LOCAL RESOURCES



Despite the recent progress made in terms of bringing electricity to more parts of the world, there is still more work to be done. Though the number of people without access to electricity is falling – from 1.2 billion people in 2010 to around 850 million people⁽¹⁾ today, mainly due to progress made on this front in India, Bangladesh, Kenya and Myanmar – electrification is not arriving at the same speed everywhere. As the International Energy Agency (IEA) highlighted in its *Africa Energy Outlook 2019* report⁽²⁾, “nearly half of Africans (600 million people) did not have access to electricity in 2018, while around 80% of sub-Saharan African companies suffered frequent electricity disruptions leading to economic losses. In addition, more than 70% of the population, around 900 million people, lack access to clean cooking”. Though Kenya, Ethiopia, Rwanda and Tanzania have made considerable progress, the electrification rate in sub-Saharan Africa as a whole (45%⁽²⁾ in 2018) is still low and varies greatly from country to country (for example, 69%⁽³⁾ in Senegal versus 9%⁽³⁾ in the Democratic Republic of Congo in 2018). There is also a strong divide between urban and rural areas, where the high cost of extending the electricity grid makes it unfeasible.

A modern approach to traditional biomass conversion

The age-old use of solid biomass as a domestic fuel (in the form of firewood, charcoal and animal dung) is still predominant for cooking. Though many countries do encourage the use of alternatives such as butane gas, bioenergy still accounts for almost two thirds⁽²⁾ of final energy consumption in sub-Saharan Africa, which causes significant indoor air pollution and gives rise to problems related to deforestation, such as the resulting decrease in CO₂ absorption. Improving fuels used for cooking and making them more sustainable is therefore a priority.

However, biomass is sub-Saharan Africa’s number one resource for the energy transition. Equipping houses with small methanizers would offer significant biogas potential. The commercial production of high-performance biomass



conversion to generate heat, electricity and biofuels is also a circular economy option with high added value for the local area, particularly as many agricultural residues can be used (e.g. rice straws, cotton stalks, millet stalks, sorghum stalks and invasive plants like reeds).

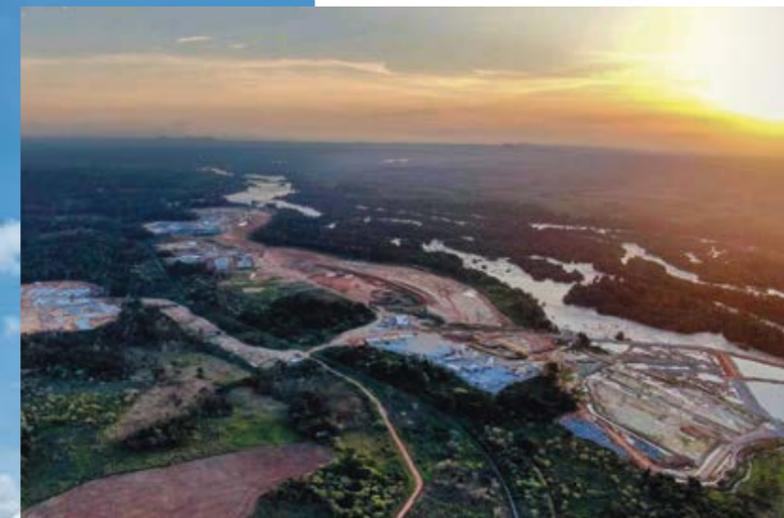
Surge in low carbon renewable energy

However, the electrical system must be significantly developed to meet increased energy needs in the future. The IEA⁽²⁾ estimates that renewable energy will have to make up three quarters of the additional electricity production. Challenges and opportunities vary greatly from country to country, but local resources might be abundant. According to the International Renewable Energy Agency, only 8% of technically feasible hydropower potential (1,100 TWh) in Africa is developed. It is estimated that Rift Valley in Kenya has 9 GW of geothermal potential, only 6% of which is currently used. Additionally, Africa has the richest solar resources on the planet, but has installed only 5 GW⁽²⁾ of photovoltaic panels, accounting for less than 1% of global capacity. Several countries benefit from high-quality wind resources, most notably South Africa, Senegal, Ethiopia and Kenya. The Taiba N'Diaye wind farm in Senegal (158.7 MW) has been fully operational since it was launched in May 2020. According to the Senegalese government,



• **Africa's electricity demand is growing twice as fast as the world average** due to population growth and urbanisation, which will create new needs in terms of cooling, mobility and industrial production⁽²⁾.

• **Electricity in Africa is highly exposed to the effects of climate change.** Rising temperatures will increase the need for air conditioning. The frequency and the intensity of extreme weather events is set to lead to more variability in hydropower output, which underscores the need to diversify renewable energy sources and reinforce regional interconnections⁽²⁾.



EDF is a partner of the largest biomass power plant in West Africa

In Côte d'Ivoire, the Group and its partners (Meridiam and Biokala), through their joint venture BIOVEA Énergie, will design, finance, construct and operate a 46-MW biomass power plant for twenty-five years. The plant, which is due to be commissioned in 2023 and is located 100 km east of Abidjan, will be powered using agricultural waste from the 12,000 local farmers and meet the electricity needs of the equivalent of 1.7 million people. In return, the farmers will be able to use combustion ash from the plant as a natural fertiliser. Throughout the concession contract, the plant will reduce CO₂ emissions by 4.5 million tonnes.





the wind farm is expected to eventually boost the share of renewable energy to 22% of the country's energy mix and reduce its CO₂ emissions by 300,000 tonnes each year.

However, in many countries, access to electricity is hindered by the cost of building production and distribution infrastructure. For example, in Madagascar, a country as big as France but with a population of 25.6 million, the electrification rate levels out at 15%, the high-voltage network covers only 400 km and the low-voltage network is 1,000 km long. This is why the IEA believes that greater electricity access in sub-Saharan Africa will require the development of minigrids in 30% of cases and autonomous off-grid systems, such as solar kits with photovoltaic panels and a storage battery for domestic and agricultural needs, in 25% of cases.

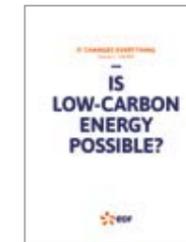
KEY FIGURES⁽²⁾

- Africa is home to 17% of the world's population and accounts for 4% of investments in global power supply.
- The energy sector in Africa accounts for only 2% of cumulative global CO₂ emissions.



(1) IEA World Energy Outlook 2019, November 2019. (2) IEA, Africa Energy Outlook 2019, November 2019. (3) IEA.

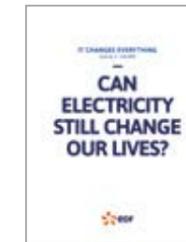
IT CHANGES EVERYTHING
A magazine that addresses the major issues of the energy transition.



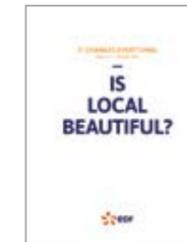
Issue no. 1 – July 2019



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Issue no. 3 – July 2020



Issue no. 4 – October 2020



Radio shows exploring and challenging the shift currently taking place in the digital era, with three guests: Béatrice Cointe, sociologist and research fellow at the CNRS, Nicolas Ceccaldi, co-founder and Managing Director of Futura Gaïa, and David Djaïz, author and lecturer at the Paris Institute of Political Studies.

Interviews with well-known figures and experts that “change everything”.

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Localism, a drive to commit to a more local focus?

Jean Viard, sociologist and economist, confirms that: "We are living in a globalised world, a world we are unable to control. It is important everyone is able to cultivate a more tangible, reassuring environment for themselves."

This local revival – visible in areas as diverse as the food industry, energy and the exchange of goods and services – is facilitating the emergence of a genuinely local economy. Casting an anchor rather than withdrawing into isolation, this sea change shows the drive of communities and individuals to bring about positive change in the environment, society, the economy and even politics.

P. 04

Balance, solidarity and acceptability: global systems improving local systems.

According to Arthur Keller, specialist in societal vulnerability and resilience strategies, "it is time the State empowered local elected officials and acted as a facilitator of community transformations".

Arising from criticism levelled at globalisation, localism pursues environmental and social progress that is widely supported by public opinion. But to achieve this progress, coordination at a higher level is required. EDF supports regions amid the emergence of these new ways of working collectively as part of a network.

P. 20

In island regions without electricity, a local approach fosters innovation.

"Concrete action, innovation and democratic vibrancy take shape at local level," according to Mathilde Woillez, geographer and regional planning and development specialist. Against a backdrop of diverse contexts and local resources, non-interconnected zones have been developing innovative solutions. EDF supports zones such as Sein island in Brittany and sub-Saharan Africa in their energy transitions by ramping up the development of renewables and locally recovered energy, which promise liberation from fossil fuels.

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