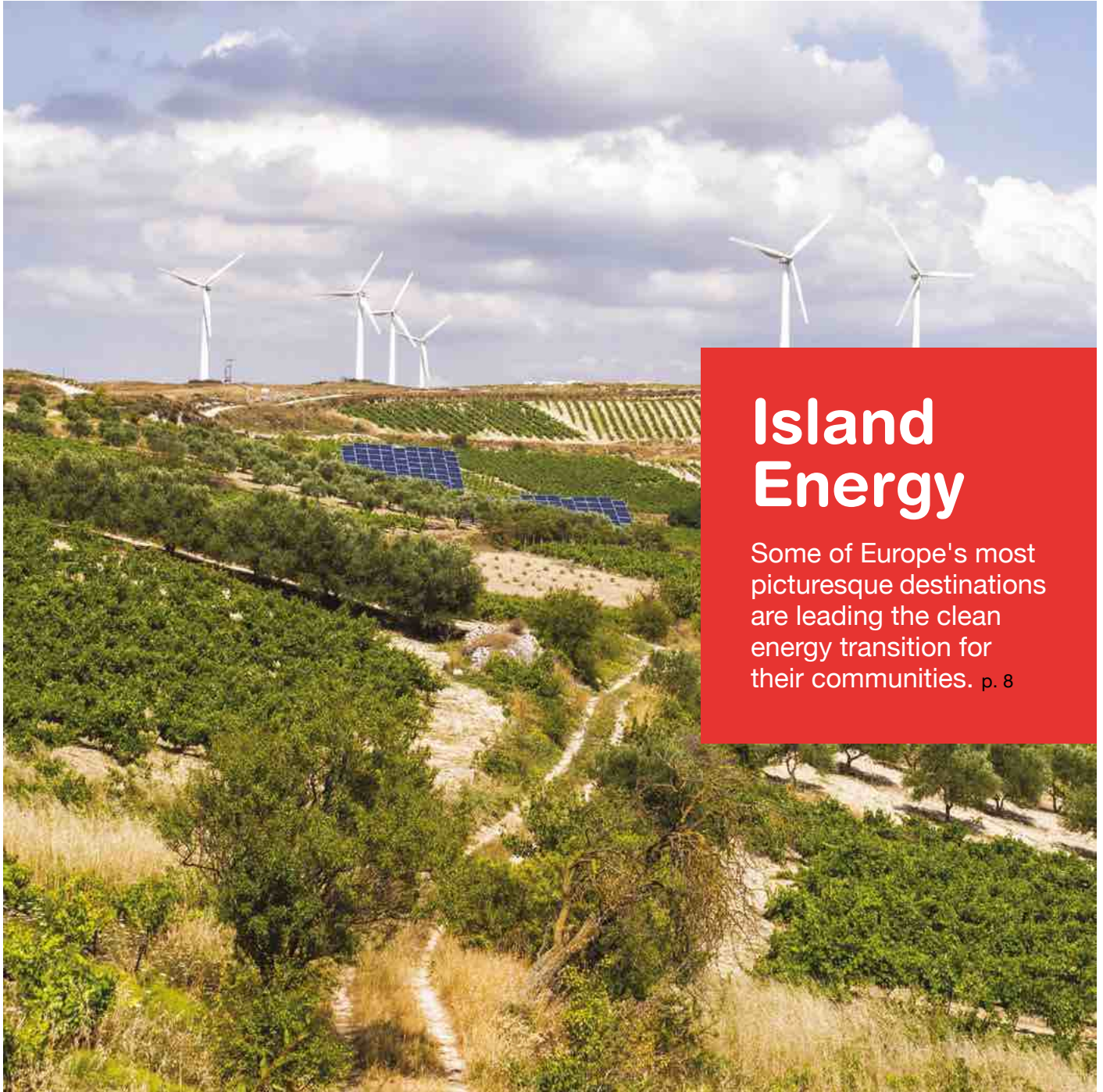


REVOLVE

QUARTERLY INSIGHTS INTO A CHANGING WORLD

N° 36 | Summer 2020



Island Energy

Some of Europe's most picturesque destinations are leading the clean energy transition for their communities. [p. 8](#)

Resource Efficiency Around the Med [p. 16](#) Holographic Magic [p. 54](#)

Lockdown in Lisbon: EU Green Capital [p. 70](#) Circular Fashion and the 9 Rs [p. 76](#)

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- Wit, and acuity of the opinion,
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All submissions will be posted online and promoted on **our social media channels** in a special **#ThisTimeAround** mobility campaign.



Deadline

Contributions can be submitted **from 4 May 2020 - 31 July 2020 (23:59 CET).**

All contributors will be notified of the results by Thursday, 20 August 2020.



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The REVOLVE communication group is about fostering cultures of sustainability. With offices and staff in Barcelona, Beirut, Brussels, Lisbon, and Vienna, we publish an international magazine (ISSN 2033-2912) that compiles the 'best of' from our online content in quarterly issues focusing on water (winter), nature (spring), energy (summer), and transport (autumn) with the circular economy as a recurrent theme. To subscribe, order back issues, or discover all our publications, including our country and industry reports, visit: www.revolve.media/shop



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Cover image: Wind Farm and Olive field in Crete Island, Greece.
Photo: Rosana Scapinello

REVOLVE is committed to taking climate action to limit our carbon footprint on Earth. We have a zero-waste policy for all our products and activities, from recycling our exhibition canvases [see our REPURPOSING program] to offsetting our emissions from travel [see our REFOREST program].

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In partnership with Reforest'Action in 2019, REVOLVE offset 14 tons of CO₂, generated by 60,802.18 kilometers of staff travel, via 14 Verra-certified carbon credits from a forest conservation project in Brazil, and planted 98 trees in Roupage, the Ardennes territory in south-eastern Belgium.

Going beyond investments in single-point solutions

We are working to accelerate the transition to a zero-carbon economy by using systems innovation to effect change in whole places and value chains.

Climate change is not a distant possibility. The capacity of the Earth's system to absorb greenhouse gas emissions is already exhausted. The IPCC Special Report on Global Warming of 1.5°C estimates that human activities have already caused approximately 1.0°C of global warming above pre-industrial levels.

Changes in temperature, precipitation, sea level, and the frequency and severity of extreme weather events are already affecting how much energy is produced, delivered, and consumed around the world. A global crisis such as the COVID-19 pandemic, aggravated by climate change, impacts the energy world: in the U.S., the price of an oil barrel went negative on 20 March 2020 for the first time ever.

The energy world needs to think in systems

In the last 15 to 20 years, innovation in the energy sector was focused on single-point solutions and commercial scale-up. The traditional paradigm of innovation policy was about supporting research and development and engineering projects, and there was a certain confidence that the world was going to be able to innovate itself out of the climate crisis and eventually find a way to decouple economic growth from environmental impacts.

Today, the energy sector accounts for approximately 2/3 of global CO₂ emissions. Business- and innovation-as-usual are not delivering a 1.5°C world. Technology advances alone will not solve the climate crisis: the two decades of technology-focused innovation policy need to be followed by a different innovation paradigm. Innovation support in the energy sector must of course continue, and it will, as it lies at the heart of the European Green Deal. However, it needs to be coupled with social, political, economic, financial and institutional innovations as well.

Fast, large-scale change is possible, but the goals of public support programs such as the European Green Deal, which sets the goal of net-zero-carbon emissions by 2050, as well as a 50-55% cut in emissions by 2030, cannot be met by the current rules, norms and short-term culture of the financial system. Nor will they be met by the current practices and accepted wisdom of commercially successful innovation solutions and venturing. Public support programs funding research and innovation need to enable more than advanced engineering and substitution solutions.

Science shows that we need to immediately phase out all fossil fuels to meet the 1.5°C goal, and the EU Member States have already committed to phasing out environmentally harmful subsidies by 2020. Yet, we continue to subsidize oil, gas and coal. Governments could instead direct these subsidies to support community-led just transition in regions

The climate innovation challenge is so complex that innovation needs to be conceived and deployed to catalyze change at a systems level.

like Upper Silesia in Poland and Debagoiena in Spain – where EIT Climate-KIC is working on a 'deep demonstration' to phase out coal extraction.

Shifting investment culture to support more resilient systems

There are various ways innovation can help shift investment cultures to longer-term value cycles. One of them is to focus our efforts on designing and using innovation to help us learn as fast as possible how to change multiple systems at once – achieving the critical structural and exponential changes that must occur rapidly and simultaneously on multiple fronts to fight the climate crisis.

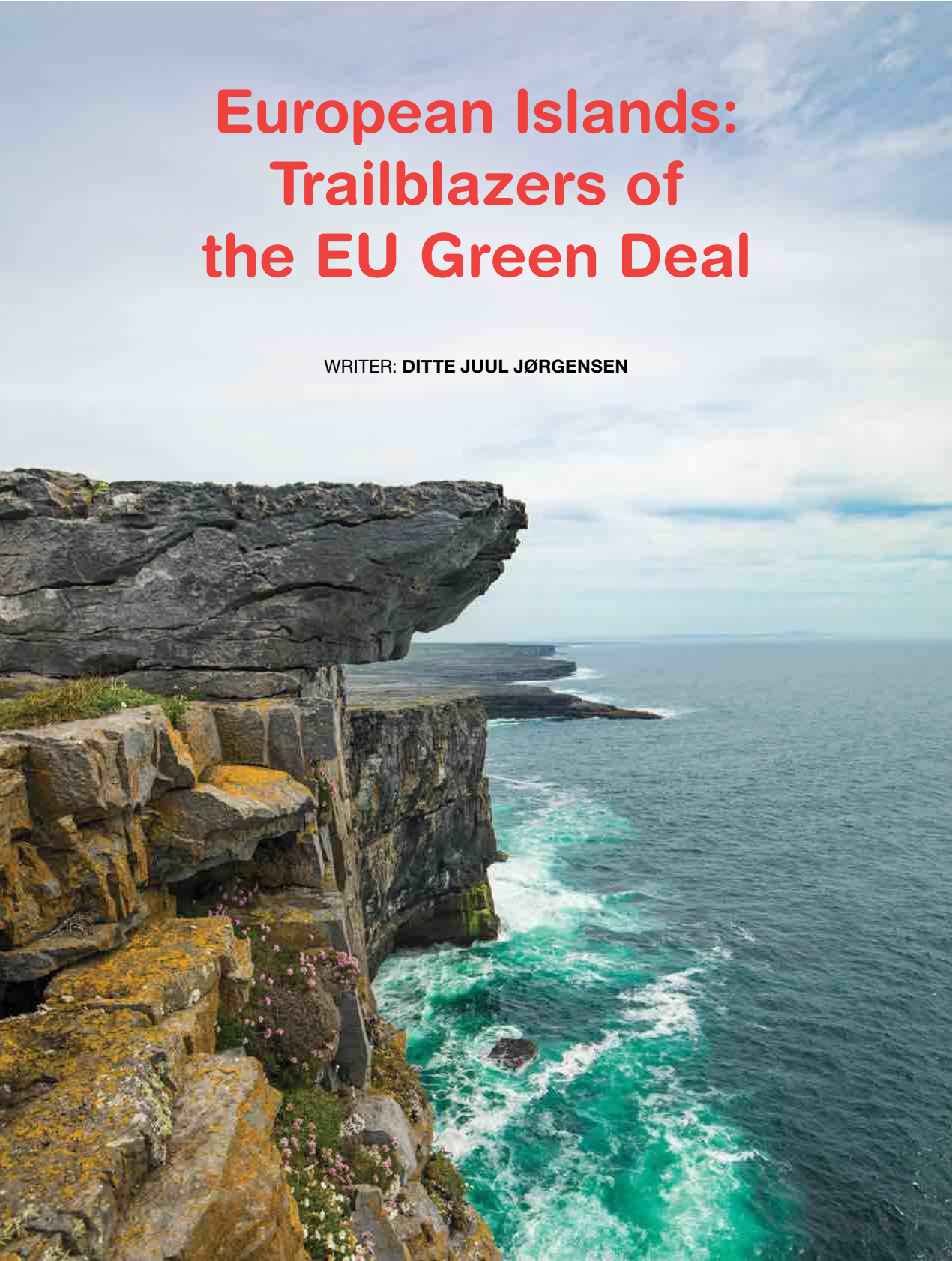
The European Union has some great tools at its disposal, such as the EU Taxonomy and the Green Bond Standard, to unlock rapid decarbonization and resilience and to help Europe embark on a green future and recovery from the COVID-19 pandemic. The European Green Deal already frames the challenge not only from an economic and environmental lens, but also from a societal lens (for example with the Just Transition mechanism founded with 1 million euros).

The EU now needs to work with the ambitious leaders of our cities, regions, countries and businesses to make extraordinary change possible. Together, they can unlock a transition to a fairer and more resilient energy system, one of Europe's toughest challenges, and greatest opportunities. ●

KIRSTEN DUNLOP
CEO OF EIT CLIMATE-KIC

European Islands: Trailblazers of the EU Green Deal

WRITER: DITTE JUUL JØRGENSEN



1

Europe is leading the fight against climate change and has set itself the goal to become climate-neutral by mid-century. This is one of the main priorities of the European Commission led by President Von der Leyen. The European Green Deal establishes a roadmap of actions across all policy areas to achieve our goal of climate neutrality by 2050. The Green Deal is an agenda for green growth and a just transition in Europe. This sustainable transition of our economies and societies will also help drive sustainable economic recovery from the current Covid-19 crisis.

Energy consumption and production represent 75% of EU greenhouse gas emissions. Energy policy is therefore central to the European Green Deal and the shift to a climate neutral Europe. European islands are in an eminently favorable position to be trailblazers of the European Green Deal and the green energy transition. There are more than 2,200 inhabited islands in the EU, where 15 million Europeans live. They usually have access to a rich array of renewable energy sources, such as wind, sun, wave and tide. These sources, combined with energy

efficiency measures and flexibility solutions, such as demand response and storage, can create decarbonized local energy systems, which can reduce energy costs significantly.

Despite these clear advantages, we see that many islands still rely on expensive and polluting fossil fuels, in particular diesel and heavy oil generators. In many cases, islands simply lack the resources and expertise to develop and implement their clean energy transition plans. Moreover, the cost of electricity generation on non-connected islands is up to 10x the production cost on the mainland. For example, on some of the smaller and more remote islands of Greece, generation cost can be over €1,000 per MWh, while the average wholesale price in Greece is below €70 per MWh. These additional costs are generally covered by support paid to the generators. In the case of Greece, this amounts to some €500 million in subsidies for diesel fuel per year. When we know that there are solar and storage projects being installed at €125 per MWh on islands now, one can see the enormous potential for cost savings. So achieving the clean energy transition of islands will not only

contribute to realizing the objectives of the European Green Deal, but also benefits local populations and island economies in many ways: reducing pollution, improving energy security, and providing jobs and economic opportunities to islanders.

Attaining these goals cannot be addressed at mere island-level. The common challenges that islands face call for joint efforts and joint solutions. The European Commission and Member States need to work together, identifying common solutions and best practices, and ensuring that approaches are coherent with EU policies and legislation, with the ultimate aim of facilitating the replacement of fossil fuel subsidies by sustainable alternatives and to incentivise clean investment in islands.

To do precisely that, and support local island communities to develop and implement their transition plans, the Commission launched the Clean Energy for EU Islands Initiative in 2017, as part of the Clean Energy package which addressed the three main priorities of EU energy policy: security of supply, affordability, and sustainability.



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- 1. Islanders founded the Aran Islands Energy Cooperative in 2012. It is running innovative pilots with Horizon 2020 and Interreg funding, and currently developing a 2.7 MW wind power plant, retrofitting homes, and deploying heat pumps or other renewable energy sources for domestic hot water and space heating. Photo: Conor Luddy
- 2. Sifnos aims to become 100% renewable and self-sufficient. The island already counts numerous wind and solar PV installations. Photo: Demie Hadji

#CE4EUI

The Clean Energy for EU Islands Initiative

Europe's 2,200 inhabited islands are often small isolated systems and markets. But they have the potential to lead the EU's clean energy transition by reducing their dependency on energy imports through the better use of locally available renewable energy sources. The Clean Energy for EU Islands Initiative, launched in May 2017, supports European islands in this effort through a long-term framework to assist islands in producing their own sustainable, low-cost energy, with the following impacts:

- Lower energy costs and more renewable energy production, coupled with cutting edge energy storage infrastructure and demand response systems
- Less reliance on energy imports and more energy security
- Improved air quality, lower greenhouse gas emissions, and less impacts on islands' natural environments
- New green jobs and business opportunities that contribute to islands' economic self-sufficiency

To support this transition, the European Commission launched the EU Island Secretariat in 2018, which:

- Promotes the energy self-reliance of islands
- Encourages islands to reduce their dependency on expensive fossil fuel imports, thereby reducing the burden on public budgets
- Delivers best available, tailor-made solutions to increase renewable energy in the islands.

In 2019, 26 EU islands launched their clean energy transition plans with the support of the Secretariat, and pledged to publish their clean

energy transition agendas by summer 2019. Building on the network of the Secretariat, the Horizon 2020 EU Island Facility project (NESOI) aims to mobilize over €100 million in clean technology island investments by 2023, delivering bankable clean energy projects using cascade funding (easy-to-access lump sums).

Several insular success stories were recently awarded the European Commission's Horizon 2020-funded RESponsible Island Prize, which rewards islands that have made significant progress in terms of local renewable energy production (especially electricity, heating, cooling and transport). The Danish islands of Bornholm and Samsø received the first and second prizes respectively, with the Scottish Orkney Islands arriving third.

The 26 first islands have been developing their Clean Energy Transition Agenda's with the Secretariat and at the same time provided feedback to shape the methodology, which has now led to an additional 14 islands embarking on the same transition path using the methodology put forward along with the experiences gathered from pilots and pioneers.

In June 2020, at the end of the Croatian EU Presidency, a MoU was signed by most island Member States to ensure the long-term framework for the CE4EUI initiative. According to Jeppe Jensen, Project Coordinator at Climate Alliance for the CE4EUI Secretariat:

"This is a great announcement in the hunt for aligning all levels of governance and create the enabling framework for the local clean energy transition on EU islands."

The Clean Energy for EU Islands Initiative aims to support EU islands in their decarbonization processes. Its signatories are committed to establishing: "a long-term framework to promote replicable and scalable projects [...] to accelerate the clean energy transition on all EU islands." It has so far taken a bottom-up approach, creating a community of committed islands and providing technical support for the development of their transition plans.

To help the Initiative, a secretariat was established in 2018. It provides support to 26 Pilot and Pioneer Islands in order to develop their Clean Energy Transition Agendas and help citizens, local authorities, local businesses and academic institutions work together to advance progress on their islands. Another 24 islands were selected to receive support for the development of concrete elements of their transition plans.

In addition, a Clean Energy for EU Islands Forum was established to engage with stakeholders and public authorities, and to share best practices. Four meetings have so far been organized since 2018, with the timing of the next Forum dependent on developments regarding the COVID-19 outbreak. The Islands Forum has become an important platform for addressing cross-cutting issues and for the implementation of relevant EU legislation.

Finding the Funding

All policies supporting islands need financial backing to get off the ground. In this regard, EU investment funds and facilities have been supporting EU islands for some time now. The mobilization of adequate private and public funding for green investments in islands is a top priority both for EU

funds (Horizon Europe, LIFE, regional funds and InvestEU, the Just Transition Mechanism) and for other sources of financing. The Horizon 2020 programme (research and development) launched several calls for proposals specifically targeting the energy transition of islands. The islands community has indicated a clear wish for this work to be stepped up in terms of both ambition and scale. For example, under the New Energy Solutions Optimised for Islands

3. Salina aims to decarbonize its power generation plants, switch to a 100% electric and hybrid mobility model, increase its energy efficiency and decarbonize its maritime transport sector. Photo: Bornholm Island, Denmark, by Leonhard Peters
4. Bornholm's community has been creating a living microgrid demonstration lab since the 1980s. The island counts 16 MW of combined heat and power, 29 MW of wind, 6.5 MW of solar photovoltaics (PV), 2 MW of biogas as well as 34 MW of diesel and 25 MW of oil-fired steam generation. Photo: Mstyslav Chernov



(NESOI) facility, supported by Horizon 2020, islands can receive backing for the next steps towards implementation of their plans. The facility will provide training, technical support, cooperation opportunities and robust funding opportunities to help energy transition plans translate into more renewable energy sources, building and energy infrastructure retrofitting, energy bills reduction, local job creation and more. This project has just started, and three calls for proposals are foreseen up to 2023. With a total budget of €3.1 million for grants, it is expected to mobilize more than €100 million of investment in sustainable energy projects.

Energy consumption and production represent 75% of EU greenhouse gas emissions.

Going Global

In a worldwide perspective, the EU is acutely aware that numerous non-EU island states face similar challenges to EU islands in their energy transition and in enhancing their resilience towards the rise of the sea level. The 2015 Paris Agreement clearly acknowledged that islands are particularly vulnerable to

climate change. The worldwide community of islands can learn a lot from each other, if only by sharing experiences and dissemination of best practices. The Commission is mobilizing support and resources for the transformation of energy systems in Small Island Developing States (SIDS), under the umbrella of the International Renewable Energy Agency (IRENA).

The European Green Deal is relevant for every European. It can help us build green growth, jobs and opportunities in Europe. We know that moving towards a climate neutral economy by mid-century is an ambitious journey and that the energy sector will need to make a major contribution. Local communities

- 5. Kókar wants to be the first Baltic island to switch to clean, locally-produced energy, storage and use, thanks to wind, biomass and solar power. Photo: Rusaltjka
- 6. The Canary Islands established an Action Plan for Sustainable Energy Islands in 2012. La Palma Renewable is developing an insular plan for a new energy culture (*Plan Insular por una Nueva Cultura Energética, PINCE*), and is aiming for full decarbonization and self-sufficiency in the energy sector. Photo: Rettenberg
- 7. Aran Islands, Galways Bay, western Ireland. Photo: Peter Ascoff



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can be important drivers for the energy transition. Locally-developed projects will make a direct, tangible contribution to improving citizens' lives. They stimulate local development and economic recovery, as they tend to create local jobs and economic activity and unite and revitalize communities. As always, we are more efficient and stronger by joining forces at EU level. I believe the Clean Energy for EU Islands Initiative has all the potential to be a genuine flagship component of the European Green Deal. With engagement of every European citizen, we will be able to rise to the challenge of the global climate emergency. I am convinced that together we can achieve our objectives and that EU islands have a key role to play in leading the way through local engagement for clean energy solutions. ●

8. Building on the Paris Agreement, the Congress of New Caledonia adopted the Energetic Transition Scheme of New Caledonia (STENC) in June 2016. By 2030, the plan aims to reduce energy consumption by 20% for primary energy and 25% for final consumption. Photo: Quentin Fahrner

9. One in ten inhabitants of the Orkney islands generate their own renewable power through over 188 domestic wind or solar PV installations in the isles. Orkney also has the highest percentage of electric cars by populations in Scotland. Photo: Doris Pecka

There are more than 2,200 inhabited islands in the EU, where 15 million Europeans live.



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**THE OPEN DATA TOOL
EMPOWERING YOUR ENERGY
TRANSITION**



EnerMaps Open Data Management Tool aims to improve **data management and accessibility** in the field of **energy research** for the **renewables industry**.

EnerMaps tool accelerates and facilitates the **energy transition** offering a qualitative and user-friendly digital platform to the energy professionals.

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The EnerMaps project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°884161.



Euro-Mediterranean Resource Efficiency for the EU Green Deal

WRITER: MICHAEL KARNER

Humanity will consume three times the Earth’s resources by 2050. To avoid this doomsday scenario, improving our global resource efficiency is key and the European Union’s Green Deal has made this one of its top priorities. Here’s a glimpse into Euro-Mediterranean projects that have been making progress on the ground.

The EU’s Green Growth strategy and resource efficiency

The numbers presented in the European Union’s 2020 “Circular Economy Action Plan” are chilling. Over the next forty years, global consumption rates of biomass, fossil fuels, metals and minerals are expected to double, and annual waste generation is projected to increase by 70% by 2050. Half of all greenhouse gas emissions and over 90% of biodiversity loss and water stress are the result of resource extraction and processing. These numbers exemplify the highly resource-intensive “Take-Make-Waste” economic model of the world economy. In line with the United Nations SDG 12 (“Ensure sustainable consumption and production patterns”), increasing our global resource efficiency is crucial to transforming this model. According to the European Commission: Resource efficiency means using the Earth’s limited resources in a sustainable manner while minimizing impacts on the environment. It allows us to create more with less and to deliver greater value with less input.

The European Union’s Green Deal and Circular Economy Action Plan were released in 2020 to illustrate how the European Union is approaching the transition to a circular economy as an opportunity for sustainable growth. Indeed, this “future-oriented agenda” proposes a “regenerative growth model” that returns more to the planet than it extracts, in order to maintain global resource consumption within planetary limitations. It notably relies on “achieving a cleaner and more competitive Europe in co-creation with economic actors, consumers, citizens and civil society organizations.” This new EU industrial strategy, outlined in the Roadmap to a Resource Efficient Europe, will be

1. Resource-efficient greenhouses for the euro-mediterranean. Photo: MED GREENHOUSES



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based on a progressive and yet irreversible transition towards the circular economy, which will rely on moving mainstream economic players into the circular economy model. This will be a decisive step in decoupling economic growth from resource use, with additional gains in terms of competitiveness and economic inclusion. However, the road towards achieving circularity will not be an easy one. Nor is it obvious that other regions in the world will follow. The good news is that we already have numerous examples of concrete efforts to boost resource efficiency.

2. Urban agriculture in the outskirts of Barcelona. Photo: MADRE project

3. On-site resource efficiency: rainwater harvesting, solar energy production and fresh herbs. Photo: MADRE project

The Interreg MED Green Growth community’s resource efficiency efforts

Let’s zoom in on the resource-efficiency efforts of the Interreg MED Programme’s Green Growth Community (GGC): this transnational European Cooperation Programme for the Mediterranean area has been driving regional cooperation on a variety of themes, including green growth and innovation. The GGC is one of the networks to have emerged from this regional cooperation mechanism. The GGC focuses on green growth, the circular economy, the sound management of natural resources, enhancing cross-sectoral innovation and promoting green jobs and social justice through an integrated and territorially-based co-operation approach. The GGC consists of 14 projects connecting 165 partners from 12 countries in the Mediterranean

working on agrifood, eco-innovation, smart cities, waste management and green growth finance. The Union for the Mediterranean (UfM) labelled the Green Growth Community in October 2019, thereby acknowledging its potential to advance cooperation in the transition to a green and circular economy and to deliver concrete benefits to the Mediterranean region. Through its Green Growth Capitalisation Platform, the GGC supports its projects in their communication and capitalisation efforts to increase their impact at the policy level and to ensure their potential transfer and replication into other territories. One of the GGC’s main outputs consists of four White Papers on the Circular Economy. The “Make more with less: enhancing resource efficiency in the Mediterranean agro-food sector and cities for a circular economy” White Paper specifically targets Resource Efficiency. These projects provide concrete examples of



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what transitioning toward resource efficiency actually means when it comes to the Mediterranean agrifood sector.

Resource efficiency in the Mediterranean agrifood sector

Resource efficiency in agrifood can be improved in numerous ways. This is reflected in the EU’s food and agriculture Farm to Fork strategy for sustainable food – a strong component of the EU Green Deal. This strategy aims at reducing the use of chemical fertilisers and pesticides as well as antibiotics for farm animals. Together, these unsustainable practices severely pollute soils and water resources and gravely impact biodiversity. If one thinks about resource efficiency in a broader sense, the life support systems that enable us

to produce food should also be regarded as fundamental key resources to be preserved and regenerated. This is why the Farm to Fork strategy also addresses biodiversity loss resulting from farming by introducing new labelling regulations that support tree-planting and supply chains that avoid deforestation. More specifically, resource efficiency in the agrifood sector includes:

- Applying agrifood technologies and practices that minimize resource inputs during the production phase, especially for land, water, energy, fertiliser and pesticides
- Minimizing resource intensity throughout the value chain during the production, packaging and transportation of food; plastic packaging and inorganic materials (films, nylon, greenhouse coverings, agrochemical packaging) contribute to land and marine pollution and are rarely recycled

- Reducing fossil fuel consumption during the transportation of products from farms to processing and packaging locations, and finally to sale points for consumers
- Reducing labour intensity and optimizing the labour to improve efficiency and workplace conditions
- Reducing food waste throughout the production chain
- Keeping products and materials in use and regenerating natural systems, thus embracing sustainability and circularity as a cornerstone of organic production techniques within localized, small-scale food system paradigms

Since 2016, several Interreg MED Green Growth projects have been targeting these challenges to boost resource efficiency. In total, these projects tested and applied 59 pilot applications and

worked with 434 companies in Albania, Bosnia & Herzegovina, Croatia, France, Greece, Italy, Portugal, Slovenia and Spain. Here are five projects that stand out for their excellence in advancing resource efficiency:

1. MADRE:
Scaling up metropolitan and peri-urban agriculture (MPA) in the Mediterranean

The GGC MADRE project promoted and produced an assessment methodology for MPA based on good practices drawn from 6 Mediterranean cities (Barcelona, Bologna, Marseille, Montpellier, Thessaloniki and Tirana). MPA still lacks attention and support within public policies, although it is a powerful vector of sustainability. Indeed, MPA can significantly boost local food production and urban food security,

while revalorizing and giving value to abandoned (and often degraded) urban spaces. It can also create new green jobs, foster social inclusion and generate new sources of income, especially for marginalized groups. Producing fresh and often organic local produce brings a host of health and nutritional benefits, while offering lower prices due to the absence of numerous intermediaries that are often involved in the food production, transportation and commercialization process.

In terms of resource efficiency, MPA can drastically reduce the numbers of resource inputs required to produce food. Rainwater harvesting and treated wastewater can be reused for irrigation, and the large amounts of organic waste generated by cities can be composted and used as fertile soils. Paradoxically, the fact that urban spaces often lack biodiversity implies that less pesticides are needed to combat pests that can damage crops, which in turn provides more friendly habitats for essential pollinating insects. Furthermore,

“zero-kilometer” food production requires less packaging, refrigeration and fossil fuel inputs related to transport. It can also significantly boost urban biodiversity and play a positive role in reducing the urban heat island effect and providing green spaces in cities. MADRE produced the Agri-Madre mapping of Mediterranean MPA and food systems as well as a Catalogue of Good Practices in Metropolitan Agriculture.

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4. Urban agriculture also boosts local biodiversity. Photo: MADRE project

5. Resource-efficient greenhouse. Photo: Markus Spiske



2. PEFMED:
Applying the EU Product Environmental Footprint to Mediterranean agrifood production

PEFMED applied the EU Product Environmental Footprint method (PEF) and key performance indicators to 9 regional Mediterranean agrifood systems involving the dairy, cured meat, olive oil, wine, livestock feed and bottled water sectors. The project allowed companies and national agrifood associations to take stock of their environmental footprint throughout the entire agrifood supply chain. The project assisted its target groups in greening these chains through the adoption of eco-innovative practices, thereby reducing their environmental impacts and simultaneously boosting their competitiveness in a regional market that is increasingly valorizing sustainable produce. Among others, this enabled companies to identify ways in which to improve their resource efficiency and environmental and socio-economic performance by decreasing their greenhouse gas emissions and water and energy consumption rates. For instance, PEFMED applied its method to the production chain of a company producing Taleggio cheese in Lombardy, Italy. This allowed the company to realize that 81% of its environmental footprint derives from the raw milk production phase, with a further 8.1% deriving from the energy and heat consumption used during the dairy processing. The project therefore proposed that the company install solar thermal panels on its premises to provide a more resource efficient means to satisfy its energy needs.

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🌐 pefmed.interreg-med.eu



3. REINWASTE:

Green manufacturing for the food supply chain with zero inorganic waste solutions

REINWASTE supported agrifood companies in reducing their packaging volumes and replacing single-use packaging with recycled plastics or biological packaging materials. There is a dearth of such widely available technologies and solutions. The project addressed this gap by creating a dataset of enabling technologies highlighting the most promising zero waste products, which rely on chemical recycling and depolymerization, among others. Research was conducted to assess how biodegradable materials such as Polyhydroxyalkanoates (PHA) could replace fossil polymers. With the support of three public private partnerships (PPPs), the project findings were applied to three value chains to test innovative solutions in inorganic waste: horticulture in Andalucía (Spain), meat in the Provence-Alpes-Côte D'Azur region (France) and dairy in Emilia-Romagna (Italy). REINWASTE's innovative solutions were also transferred to Bosnia-Herzegovina through 4 knowledge transfer panels aimed at local food producers to identify possibilities for implementation in the Bosnian food industry. REINWASTE also implemented a local project for organic and inorganic waste packaging in Srebrenica municipality that can serve as a model for other Bosnian municipalities. Through REINWASTE's open and collaborative knowledge and technology transfer, innovative R&D based solutions to remanufacture the food supply chain through waste prevention and eco-design are thus being transferred around the Euro-Mediterranean.

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4. MED GREENHOUSES:

Encouraging green growth through innovative greenhouses

MED GREENHOUSES promoted, disseminated and transferred innovative resource-efficient greenhouses in the Mediterranean area. About 120,000 hectares of land are covered by greenhouses in the Mediterranean. They are usually low cost, low tech, labor intensive and rudimentarily equipped. The project sensitized greenhouse operators on the numerous ways in which their greenhouses could minimize their water and energy demand. The project also connected research institutions, businesses, public authorities and civil society around this theme by encouraging transnational cooperation and knowledge transfer. These kinds of efforts correspond to those that are required within the framework of the EU Green Deal: sharing innovations and building synergies through continental multi-sectoral clusters and networks is key to increasing resource efficiency along the entire value chain.

The MED GREENHOUSES technology is based on geothermal heat pump systems that make use of shallow geothermal energy present in the Earth's surface and low depth rock layers, as well as in groundwater with temperatures below 25°C. Compared to conventional greenhouses and open cultivation, these greenhouses can achieve up to 67% energy savings, 45-100% of water savings in comparison to conventional greenhouses, as well as 46-52% lower CO₂ emissions and a 30-60% reduction in fertilizer use. Using low geothermal energy in greenhouses allows for year-round cultivation, higher yields and more protection against plant diseases, while substituting fossil fuels with renewable energy sources.

✉ papachatzi@uth.gr

🌐 medgreenhouses.interreg-med.eu

5. CAMARG:

Clustering innovative zero-kilometer agrifood marketplaces

CAMARG tested an e-commerce marketplace solution to connect small producers (farmers, food artisans, small retailers) in the Mediterranean with consumers in their vicinity, allowing them to better commercialize their products and to better compete with mass retailers. Shortening supply chains in the agrifood industry is key to increasing resource efficiency, since it requires less resources for transport, storage and delivery. This solution is also advantageous for consumers, who can now access high-quality seasonal and local produce at an affordable cost. Ultimately, this can lead to behavioral change, in which consumers automatically prefer local producers to mass retail outlets. CAMARG involved 54 producers in four regions offering 358 products within 11 different food categories.

✉ mdimarzio@bo.interporto.it

🌐 camarg.interreg-med.eu

**

These Interreg MED Green Growth projects illustrate the many ways in which resource efficiency can be applied across sectors, actors and levels as an opportunity for sustainable growth. By developing transferrable and collaborative circular economy models for the agrifood industry, these projects are contributing to the EU Green Deal and providing a wealth of inspiration and experience for European actors to draw from.

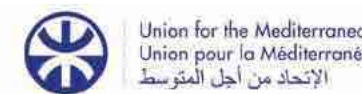
Learn more about the Interreg MED Green Growth Community in this Q&A with its lead coordinator, Mercè Boy Roura.

To learn more about the Interreg MED Green Growth Community's upcoming activities, join the Green Growth Capitalisation Platform and follow us on social media! You can find our connection details on the next page. ●



Project co-financed by the European Regional Development Fund

A project labelled by the UfM



THE MED GREEN GROWTH COMMUNITY

Promoting sustainable growth in the Mediterranean and beyond:

- Empowering and connecting Green Growth actors
- Producing knowledge on Green Growth
- Capitalising, and replicating our project results
- Informing national and EU Green Growth and Circular Economy legal and policy frameworks
- Forging collaborations and fomenting synergies between Green Growth networks, institutions and programmes.

Visit our website:

green-growth.interreg-med.eu

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REVOLVE





Building Resilient Communities through Municipal Climate Action

The COVID-19 pandemic has revealed that things we often regard as static can, in fact, change fairly quickly under certain circumstances. Over the past months, societies have had to reassess responses to the crisis that closely mirror the fight to combat climate change, showing the crucial role social cohesion plays – how shared values that shape the very experiences and success of communities can prompt drastic, long-standing changes.



Holistic systems change needs to be built from both the top-down as well as bottom-up. Communities are uniquely positioned to and gather people to act, build resilience and impact lives, which is why they are critical for climate action. Private-public partnerships with municipalities are furthering the role of communities in building climate resilience for cleaner energy that has both economic and societal benefits for residents that are also good for businesses.

**Community Choice
Aggregation for
municipalities pools
local demand to
broker cheaper energy
supply contracts from
renewables.**

**Empowering
communities**

Supporting communities to lead their own just transition is key for ensuring holistic systems change. An example of the work being done on the ground, Joule Community Power is partnering with communities in New York state to guide municipalities and residents towards reduced energy costs through local energy independence and clean energy. Joule's expertise in designing and implementing new

1. Researchers at PV project simultaneously growing crops. Photo: US Department of Energy
2. Workers at PV field. Photo: US Department of Energy

consumer-protective energy supply contracts is instrumental in creating Community Choice Aggregation (CCA) for municipalities that pool local demand to broker cheaper energy supply contracts from renewables. The program can be further paired with community solar to save residents and small businesses additional money by subscribing to a local solar farm, generating clean, renewable energy that feeds into the existing utility grid. The participants are allocated a share of the solar farm, earning them solar credits and reducing their annual electricity bills.

Through such partnership, the Town of Geneva established a renewables program allowing residents to profit from local energy while spending less on electricity and supporting clean generation. The program also generates funds for locally selected sustainability initiatives, bringing residents together

**July 2020
marks one
year that
the Town of
Geneva runs
on a 100%
renewable
energy supply.**

around a common cause. In Geneva's case, the community chose to fund a stormwater control project on Seneca Lake. Their sustainability grant money will pay for prerequisite engineering work that is needed to secure larger government funding from New York state. The \$25,000 grant from Geneva Community Power will be a key factor in accomplishing a project valued at eight times the amount of this initial award.

While the premise of community solar is simple, in practice, credible, trustworthy municipal leadership is essential in prompting residents to play an active role. The glue that held the program together over the pilot's teething stage were the people from the community on the ground building it alongside effective local leaders. The ability of projects like community solar to gather enough support to move forward is arguably bellwether of consumer

action and community strength. In this model of giving back to municipal sustainability funds, the action of 400 individual local subscribers allows all of the communities, businesses, and residents that rely on Seneca Lake to benefit from this design of renewable energy project. In light of the consequences from COVID-19, sustainability funds for current solar offerings are being redirected in the same type of triple bottom line business model to help grassroots community efforts providing relief such as food pantries and other critical services.

In Europe, we have larger discussions from the top-down perspective of what recovery and green recovery could entail. As we try to kickstart our economic system, we see the same flaws that were there before, some perhaps more clearly. With calls for a renewable focus on green recovery and collective pushes

for sustainable or green investment packages, it becomes clear that enabling municipal resiliency and sustainably injecting funds to stakeholders like cities is a crucial building block for equitable and far-reaching recovery.

Building future-proof, smarter cities

Alongside representatives of current smart city projects, financial funds, and associations, Joule is actively proposing a renewed approach to financing schemes for smart city development in an effort to foster longevity from pilot results across cities in Europe. As critical actors in the energy transition, smart city pilots and innovative municipal leaders in Europe have a pivotal role in enabling the EU to reach its climate and energy targets for 2030: to

increase its share of renewable energy, improve energy efficiency by 33%, and cut greenhouse gas emissions by 40% from 1990 levels. The direction many cities have gone to achieve climate goals while serving local communities is that of "smart cities". Beyond using information and communication technologies for more effective resource use and reducing emissions, smart cities can improve transport networks, heat and light buildings more efficiently, and upgrade essential infrastructure like water supply and waste disposal facilities. In facing the immediate repercussions of the COVID-19 crisis and anticipating the longer impacts of climate change, this kind of smart resilience for cities has never been more fundamental.

3. Seneca Lake, New York. Photo: Piqsels.





4

One approach looks to private/public capital to invest in solutions that have proven successful and whose models have been assessed to accelerate the scale-up of tried and tested solutions. To stimulate the deployment of smart city solutions across Europe at scale, and simultaneously grow the market, the creation of a more unified funding format or system has the potential to offer great change. For instance, merging two complementary support instruments into a new format, comprised of research and innovation grants and bank-driven support funds together. This novel form allows the bundling of market-ready solutions to be tested and implemented, and its success to be measured against specific impact metrics – including KPIs addressing the financing of commercial developments or upscaling.

By bridging the gap between research grants and bank support, and sharing risks between entities – public authorities, industry, research, and financial stakeholders can move smart city initiatives beyond the pilot stage. The aim is to foster a more effective exploitation of current smart city approaches by rooting innovation projects in co-developed policy, technical and financial models, encouraging joint commitment and risk-taking by adopting new metrics to reflect both financial and socio-environmental values. This would enable the provision of financial entities (private and public capital alike) during the pilot phase with unmediated confirmation from their financial experts that business-cases are sound and risks acceptable to be upscaled as well as certainty of actual exploitation of solutions.

Key enablers of co-developed, smart cities

- Continued robust grant financing for research and innovation
- Pan-European knowledge sharing and adopting successful commercialization models from other cities
- Inclusion of financial funds in the grant proposal
- Combined pilot and commercialization metrics in the same project

As many strive to support cities, communities and people in banding together and strengthening climate action, enablement comes from collective action spurred in both the bottom-up and top-down. Leadership is needed not only to challenge the status quo but propose alternatives and see them through the teething stage – be it enduring tests of community support for renewables projects in New York state or encountering barriers to the long needed scale-up of smart cities in Europe. Enabling these actors in the energy transition has to happen holistically, where financially viable, replicable projects that serve people and communities inclusively can be scaled up to be impactful for the environment and gain investment. In this way, municipal action can be fit for purpose to serve their citizens and communities while building momentum and bolstering the bold change from larger levels. ●

4. Aerial shot of public transport station.
Photo: Sergio Souza



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Q&A with Elizabeth Press

Director for Planning and Programming at the International Renewable Energy Agency (IRENA), Elizabeth Press, provides her take on renewables in the current COVID-19 crisis and contextualizes key findings from IRENA's *Global Renewables Outlook*, which shows the gains to be had by transforming the energy system in an inclusive manner.

Do you believe climate policies are taking the backseat due to the COVID-19 crisis?

The COVID-19 crisis does not change the existential path required to decarbonize our societies and meet sustainability goals. The immediate priority is understandably for people's health and safety, and the security of their livelihoods, but green stimulus and recovery packages are feasible and necessary to avoid the type of social and economic catastrophe that climate change threatens.

The long-term planning and positive momentum that exists in the global energy transformation mean that the renewables and energy transitions trends will continue. Today, renewables account for 1/3 of global power capacity and annual capacity additions from renewables are regularly outpacing those from conventional fuels. Much of this change has been driven by the strong business case of renewables. And we have seen this during the past few months when renewables were the fuel of choice in the time of crisis.

While the economic downturn will inevitably affect the renewables sector, impacts will be smaller than on other industries because of these strong foundations. Fundamentally, governments must look to renewables as a recovery choice for long-term resilience of economies and societies. IRENA's *Global Renewables Outlook* outlines pathways for a global energy transformation based on renewable energy by 2050. The report highlights the importance of aligning short-term recovery efforts with the medium- and long-term objectives of the Paris Agreement and the UN Sustainable Development Agenda.

What is the role of renewables in achieving global climate goals of the Paris Agreement?

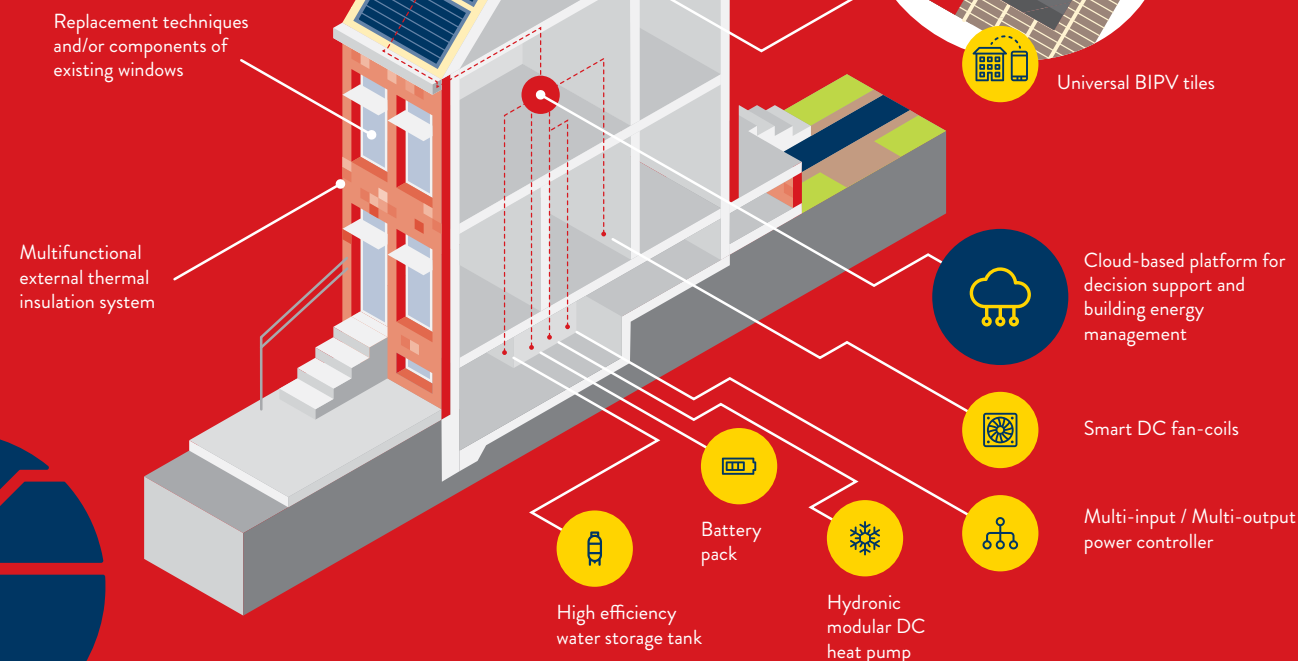
Energy-related CO₂ emissions have risen by 1% every year over the past decade. We are not on track to meet the Paris Agreement climate goals. While the COVID-19 crisis and oil price slump may suppress emissions in 2020, a rebound is likely to restore this long-term trend.

IRENA's *Global Renewables Outlook* describes an ambitious yet realistic pathway to halt the rise of global temperatures. To keep global warming below 2°C, renewables would have to accelerate further, cutting energy-related CO₂ emissions by 3.8% per year on average and 70% in total by 2050. **Two-thirds of global power supply would have to come from renewables by 2050.**

Coupled with an additional deeper decarbonization consistent with holding the line at 1.5°C, emissions could decrease to zero by mid-century. The remaining emissions decrease would have to come from so called "hard-to-decarbonize" sectors, namely heavy industry and, in the transport sector, aviation and shipping. Solutions for these sectors range from green hydrogen and synthetic fuels, direct electrification (such as electric vehicles), advanced biofuels and carbon management would play a key role.

Continues on page 52

“We are not on track to meet the Paris Agreement climate goals. Only an energy transformation driven by renewables will allow us to hold the line on rising global temperatures. A climate-safe energy transformation can cut 70% of energy-related CO₂ emissions by 2050 compared to today's levels.”



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- Involving stakeholders, supporting energy financing and the exploitation of renewable energy.
- Concept can be extended to new residential buildings in addition to existing buildings.
- Decreasing operating costs and consumer bills.
- Increasing thermal comfort for building users.
- Reducing the performance-related risk of the energy retrofit investments;



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement N° 768921.



www.heartproject.eu
info@heartproject.eu



[@HEARTProjectEU](https://twitter.com/HEARTProjectEU)
HEART Project (H2020)

VIEWS

Steamland Geothermal Energy in Iceland

PHOTOGRAPHER: PEP BONET

Due to the unique geological location of Iceland, the high concentration of volcanoes in the area is often an advantage for generating geothermal energy, heating and electricity. 100% of Iceland's electricity comes from clean sources and the government plans within 30 years to become the first country to abandon the use of fossil fuels.

Geothermal energy is heat energy that occurs naturally in the earth, and is recovered from the Earth's core. In nature, geothermal heat shows up in the form of volcanoes, hot springs and geysers. When this energy is higher than 150°C/302°F, it is considered hot enough to be used to generate electricity and heat in Iceland.

▲ Hengill

The geothermal activity in the Hengill area is connected with three volcanic systems. The Hengill region, which covers 112 square kilometers, is one of the most extensive geothermal areas in Iceland.

▼ Gullfoss

Gullfoss Geysir hot spring area. Geothermal energy is the heat energy that occurs naturally in the earth. The energy is recovered from the heat of the earth's core. In nature, geothermal heat shows up in the form of volcanoes, hot springs and geysers. The heat itself is derived from radioactive decay beneath the earth's surface.





▲ Hengill

View of Hellisheidi Geothermal plant. The geothermal heat is mostly used to heat fresh water which, when hot, can be utilized directly for central heating. 89% of all the houses in Iceland are heated this way. But the geothermal water is also used in many other ways. It is used in swimming pools, for soil warming, fish farming, drying of timber and wool, animal husbandry, green houses, etc...



▲ **Hengill** Nesjavellir geothermal plant generates electricity and hot water by utilizing geothermal water and steam.

▼ **Blue Lagoon** Svartsengi Geothermal Combined Heat & Power Plant is located next to the Blue Lagoon.



▲ **Blue Lagoon** Svartsengi Geothermal Combined Heat & Power Plant is located next to the Blue Lagoon.

▼ **Hengill** Reykjanes Power Plant.



▼ Blue Lagoon

The Blue Lagoon is known as a therapeutic bathing pool. The lagoon has proven health benefits. Scientists say bathing in the lagoon has positive effects on psoriasis and eczema. The lagoon is a very popular tourist attraction, mainly because of the many health benefits.





▲ **Hveragerdi** Green houses in Hveragerdi that use geothermal energy to heat water for central heating.



▲ **Hengill** View of Hellisheidi Geothermal plant.



▼ **Hengill** Hot springs near the Nesjavellir Geothermal Plant, which generates electricity and hot water by utilizing geothermal water and steam.



▼ **Hengill** On the road from Hellisheidi Power plant to Reykjavik, city pipes carry hot water to be used for heating.



▼ Hengill

Reykjanes Power Plant.



▼ Blue Lagoon

The Blue Lagoon is known as a therapeutic bathing pool. The lagoon has proven health benefits. Scientists say bathing in the lagoon has positive effects on psoriasis and eczema. The lagoon is a very popular tourist attraction, mainly because of the many health benefits.



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City
with most
participations:
**Salvador,
Brazil**



Cities**4**Forests

Do you believe climate policies can stimulate economic recovery?

Absolutely, and energy must be part of the recovery measures. With the right policies in place, energy transitions can generate important social and economic benefits. A cleaner energy system is fully consistent with a net positive economic impact by delivering economic growth, jobs and higher welfare.

Indeed, renewables are an engine of low-carbon development. IRENA's *Outlook* shows that transforming the energy system could lead to a higher GDP growth, achieving 2.4% more by 2050 than current plans. By 2050 the additional costs would be significantly outweighed by the benefits, with returns of \$3-8 for every dollar spent.

A renewables-based energy system would also create much needed work, especially in the context of the current crisis. IRENA is tracking renewable jobs since 2013, during which time they doubled to over 11 million in 2018. A climate-safe pathway outlined in the *Global Renewables Outlook* would increase renewable jobs to 42 million globally by 2050. Employment in energy efficiency would grow to 21 million, and to 15 million in grids and energy system flexibility. Overall, energy sector jobs are projected to expand, employing 100 million people by 2050 globally.

This increase is the result of gains in transition-related technologies (renewables, energy efficiency, and power grids and energy flexibility) that outweigh job losses in conventional technologies as fossil fuels and nuclear power in all regions of the world.

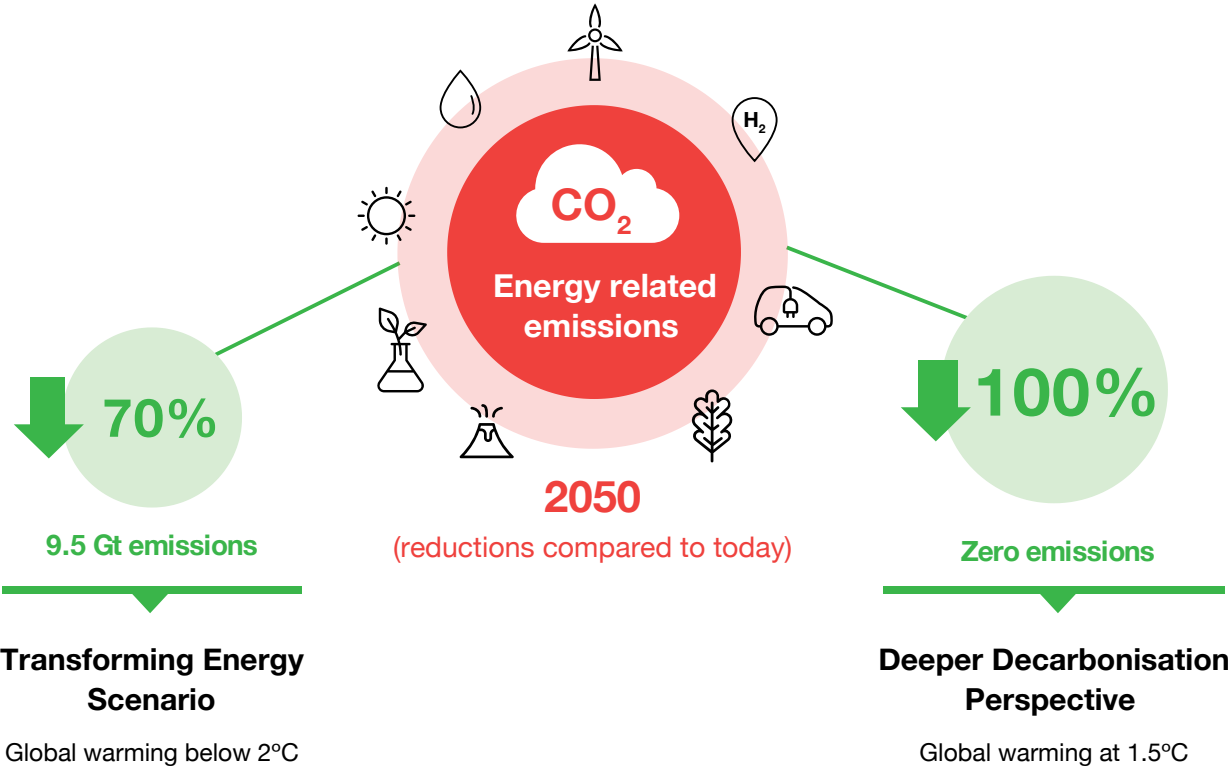
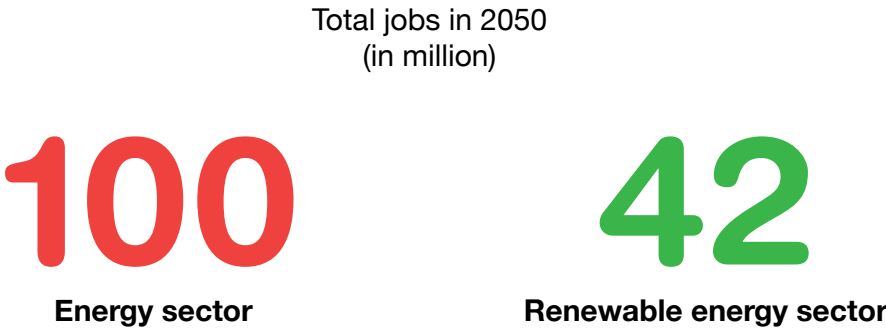
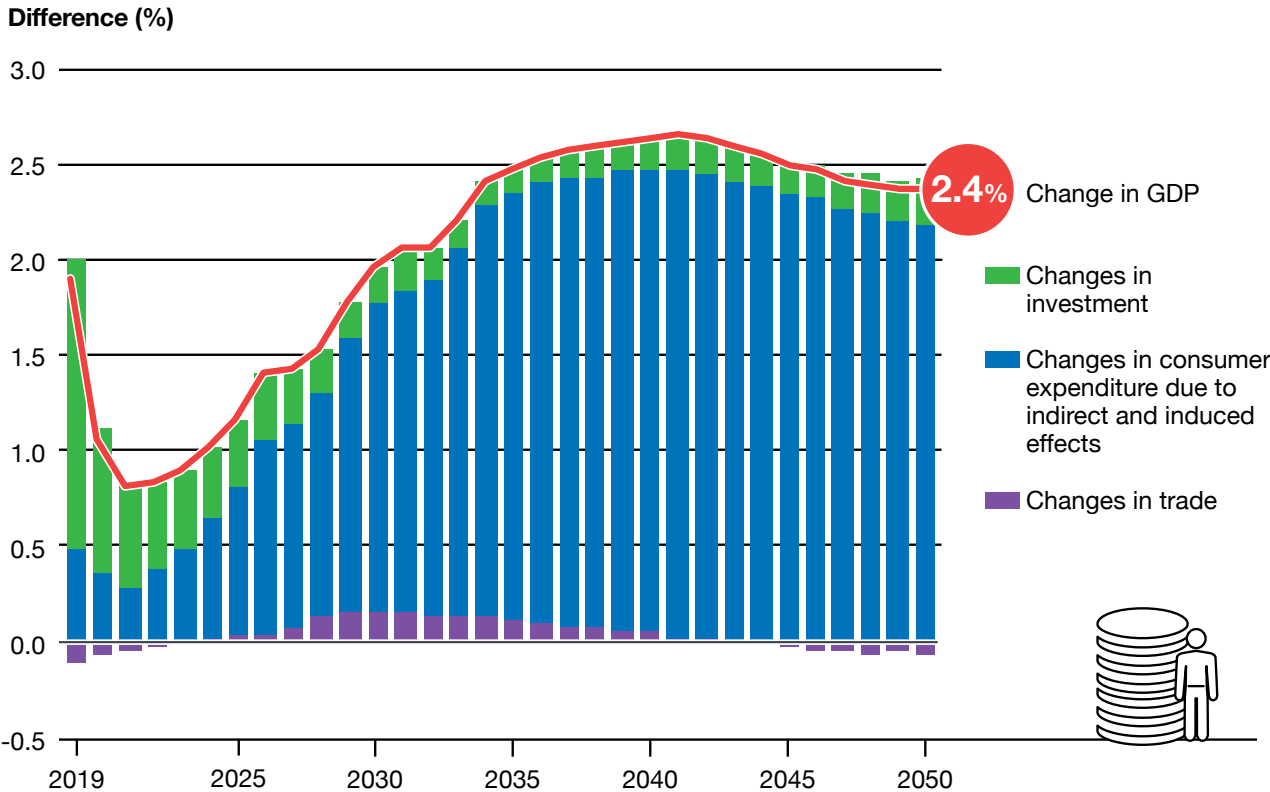
Where do you see the EU and how do you assess the EU's Green Deal?

Europe is demonstrating great leadership in the pursuit of energy transitions and net-zero policies. The economic impact of an energy transformation on the European economy is above the global average. IRENA's *Outlook* shows that transforming the energy system will boost the EU's economy by 7.4% in 2050, an equivalent to an additional \$2.6 trillion and \$46 trillion in cumulative GDP terms. This would also translate to 5.5 million new European jobs. Solar would account for 30% of all renewable energy jobs in the EU, with wind energy as the second strongest, contributing around 25% of jobs.

IRENA's *Outlook* finds that the energy transition lies at the heart of inter-linked concerns over social justice, economic inequality, and rapidly-mounting climate threats. Mobilizing significant resources in combination with increased public intervention to tackle pressing issues such as equity, justice and sustainability

simultaneously and coherently will be crucial. These issues should not be siloed but need to be considered holistically if they are to be addressed effectively and efficiently. Under the banner of a "Green New Deal", the call for a comprehensive policy approach is being taken seriously. If policy-makers

recognize that we need an approach that tackles energy and climate goals hand-in-hand with socio-economic challenges, by increasing and integrating renewables globally, then there is the potential for it to deliver the transformative decarbonization of society that is needed to meet our climate goals. ●





1

Refining the Sun

A novel holographic technology offers new possibilities for the largest source of energy on the planet – the Sun. Learn how the radical concept of solar refining is bringing the power of the sun to new horizons with the potential to deliver significant, immediate benefits.



From fueling the photosynthetic cycles that provide essential nutrients for all living species, to shaping seasons and individual biorhythms, the Sun is the original energy source for life as we know it. It is also the largest, most immediate source of energy. Sunlight provides by far the largest of all carbon-neutral energy sources. More energy from sunlight strikes the Earth in one hour (4.3×10^{20} J) than all the energy consumed on the planet in a year (4.1×10^{20} J).

Solar energy is a reputable renewable energy that can be harnessed either through photovoltaics (PV) that convert sunlight into electricity or through solar thermal technology that uses sunlight to generate thermal energy. However, traditional sun management systems are largely binary in that they operate on the availability of sunlight in its entirety. In addition, a multitude of factors can

1. HOE Green line concentration on the beach. Photo: Pedro Mas Abellán

2. Sample HOE with sun. Photo: Pedro Mas Abellán

2

decrease the efficiency of these systems including dust and high temperature, inhibiting the luxes received from the Sun and effecting overall performance. While some concentration methods for solar systems aim to increase efficiencies, these technologies fail to take into consideration that these systems do not need the entire spectrum for them to be effective. In fact, concentrating the whole spectrum actually decreases the efficiency of solar units, showing the clear need and benefit for filtering out unnecessary solar radiation.

In fact, many applications do not require the whole spectrum of sunlight. This is not only the case for operating solar panels, but also holds true for the plants we grow in our greenhouses, to the very sunlight that brightens our homes, fields and industries. What if we could split the spectrum of the sun to utilize its most efficient parts per application – filtering out the harmful or unnecessary components? Better yet, what if we could concentrate, re-direct and filter out the spectrum needed for each application, having an even greater impact that could empower individuals and the energy transition? Holographics are the answer.

Defying conventions, controlling light

Innovative holographic solutions offer countless new opportunities for the potential of solar energy for customized applications where they are needed. Through optical information storage, non-conventional optics and nano-technology, one can defy conventional optics and essentially control light in its entirety. In a provoking comparison, one could liken the Sun's rays to crude oil in that the application of holographic solutions refine sunlight by selecting the specific light and solar radiation needed for the respective applications in the most efficient way possible.

During a field test, the Sun shone at an intensity of around 80,000 luxes. With a specifically designed Holographic Optical Element (HOE), just 5% of the total spectrum was selected and concentrated to 1,443,715 luxes or – 18 “filtered suns” – providing only the energy required for that specific application. Note the significance of these results, bearing in mind the percentage of the chosen spectrum is only 5% of the 600nm range. The results are exponentially larger depending on the

optimization of the HOE with the required application, selecting a wider spectrum and concentrating it in a bigger spot. The above example was achieved using a 20cm x 20 cm HOE and concentrated on a 3cm diameter spot. Optimization and customization are key.

Setting new horizons

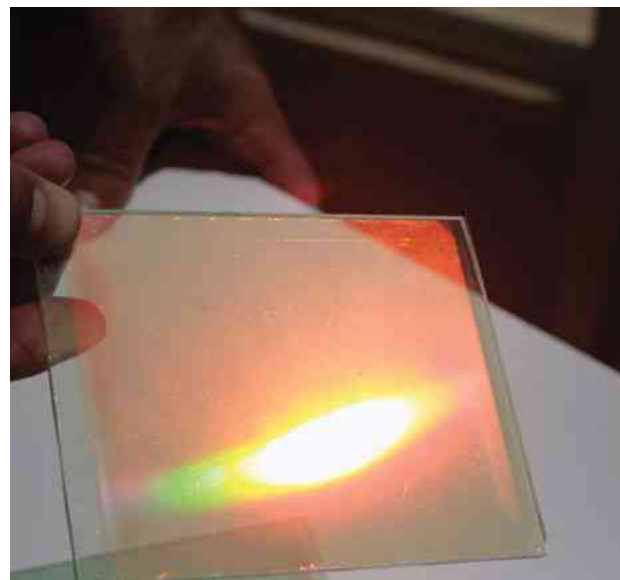
HOEs have unlimited application possibilities – all processes or applications that essentially require light, whether sunlight or artificial light – from energy systems (with and without PV panels), to waste water treatment, general disinfection, to thermal insulation, horticulture, packaging, illumination through to light filters (for medical purposes) – all are suitable candidates for holography, increasing the benefit of the solar energy harvested, the performance of the existing solar applications and contributing to cost-savings.

1. Three holograms over a bed of flowers. Photo: Pedro Mas Abellán

2. Orange HOE. Photo: Pedro Mas Abellán



3



4

On a sunny day with 80,000 luxes of sunlight, the HOE provided over 1.4 million luxes in an area as small as 3 cm in diameter.

But perhaps one of the most striking applications of this technology is its immediate contribution to improving the efficiency of the critical key aspects in mitigating climate change: renewable energy sources, lessening CO₂ production and improving energy efficiency.

With the widespread adoption of HOEs, the technology has the potential of democratizing the energy transition in a revolutionary way, empowering individuals to produce their own energy without relying on a grid, using it as direct sunlight source for all building areas, including basements, thermal insulation in new or retrofitting building projects and enabling wider authorities, industries and the horticultural world, among many others, in their energy transition efforts. In fact, authorities in the Spanish city of Alicante are considering its use in solar photocatalysis projects to regenerate the area surrounding the city's castle and in a separate project which aims to re-use waste water



5

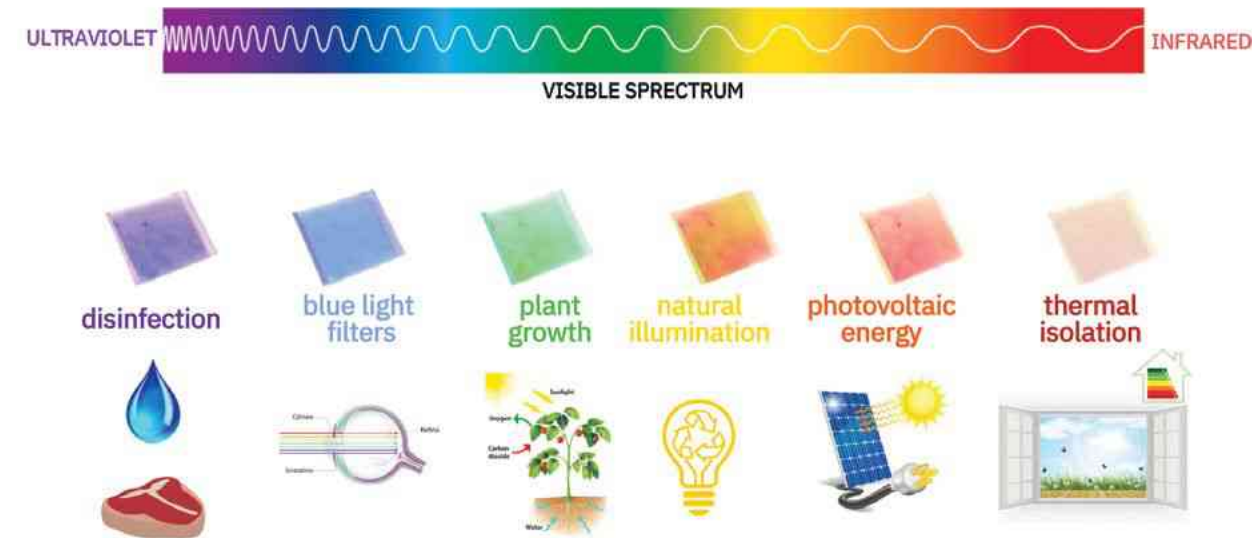
in the prevention of forest fires and reforestation efforts by bringing water up the mountains for fire extinction in a renewable, sustainable manner. ●

es.linkedin.com/in/pedromas

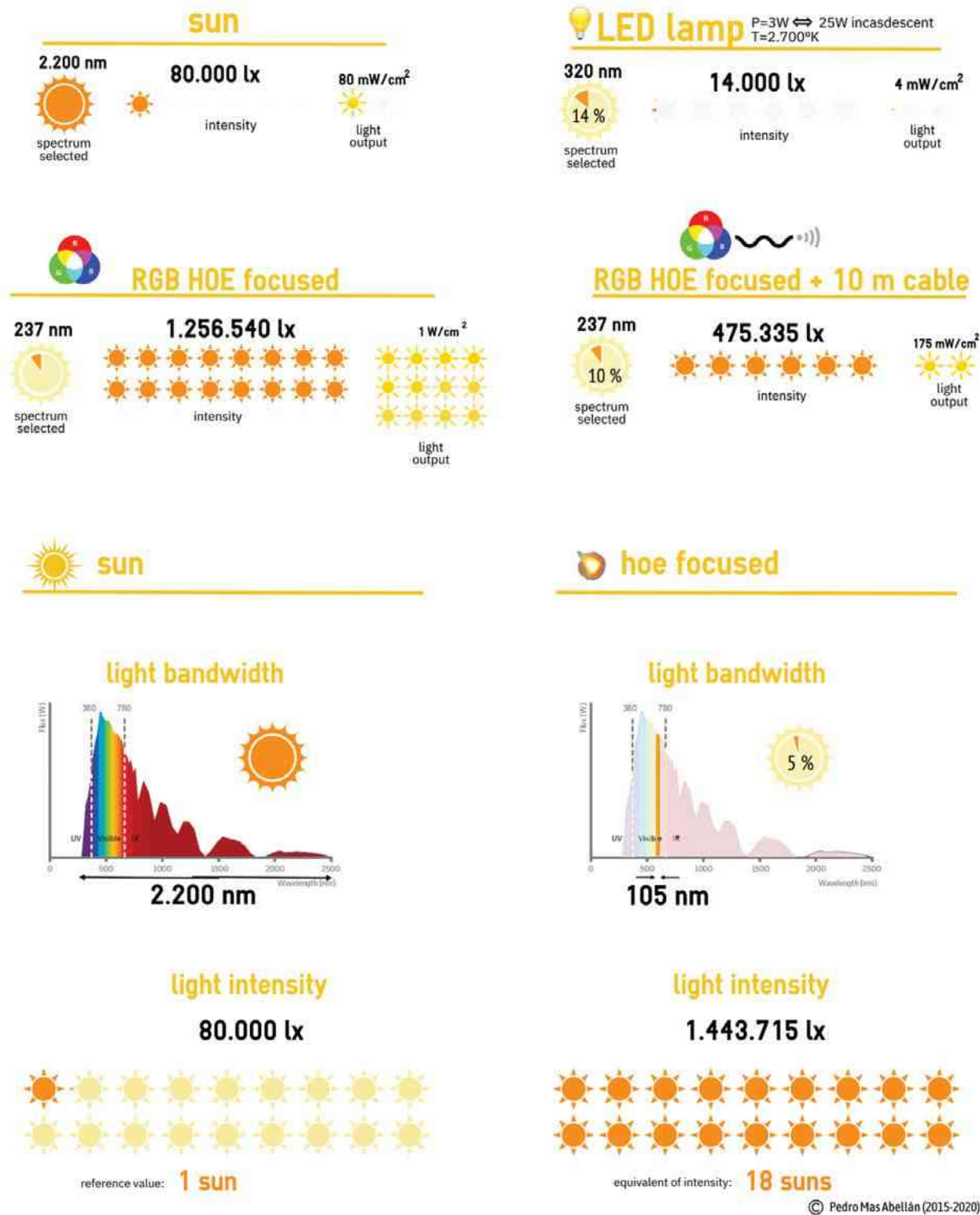
5. Sample HOE. Photo: Pedro Mas Abellán

some of the HOE possible applications

depending on chosen part of the spectrum for desired purpose



field trial comparison data between sun - focused RGB HOEs light output - the output after running it through cable - reference lamp





Genk’s Transformation Honors its Heritage

WRITER: MARTÍN FREIRE

The EU Green Deal’s vision for carbon-neutrality by 2050 requires drastic changes to the way we live, move, and produce energy to attain a competitive economy “decoupled from resource use.” Getting there entails a total shift in approach, mind-set and culture, as demonstrated by Genk – one of Belgium’s previous coal mining hubs. This is how Genk is using its sooty past to its advantage in forging a clean, diversified economy.

Over the last 100 years, coal mining was the main industry in Genk, shaping its image and culture. When the city was forced to permanently cease mining activities, local leaders looked for an alternative approach to generate revenues and create opportunities. Ongoing to this day, the transition away from industrial activities in Genk has been a long process with multiple phases.

The first major transition happened in the 1960s, after the first coal mine closure in Genk. A newly established Ford Motor Company plant was established soon after, recovering many of the coal mining jobs that were lost. During the 1980s, the city started to attract more industrial companies largely related to car manufacturing and logistics companies, becoming the core of Genk’s economy.

Economic diversification

In 2014, the car manufacturer shut down its Genk facility, forcing the city to transform yet again. This time around, however, officials decided to steer away from an industrial model dependent on a single company or industry and instead

work towards industry diversification. Located in a peri-urban region, Genk is the largest city with only around 66,000 inhabitants. Large companies tend to prioritize more robust and larger urban centers, so attracting them to Genk was a bit of a challenge. The city’s current transition approach however focuses on developing an economy based on a mix of technology firms, clean energy

companies, and an array of options for the service industry. Moving away from a mono-industrial approach and towards economic diversification was key for the success of the entire region of Limburg.

As a result, Genk has become a dynamic entrepreneurial city devoting attention to sustainable jobs and welfare creation. To secure and to strengthen the

- 1. EnergyVille. Innovation center in Thor Park, Genk, Belgium. Photo: Paulien M
- 2. View from shaft tower onto C-mine, Genk, Belgium. Photo: Berber Verpoest for Bankwatch
- 3. Exhibition on industrial heritage in Limburg, Belgium. Photo: Berber Verpoest for Bankwatch



future economic competitiveness in this phase of transition, Genk is using its manufacturing industry to its advantage for an innovative, manufacturing and knowledge economy.

Heritage as a driver

“Limburg is no longer a coal region from a mining perspective, but it is still a coal region culturally,” states Peter Boutsen, a consultant in redevelopment of coal mines and mining regions and part of the Regional Platform Mining Area (a close cooperation initiative of the Mayors of the region) during 1990-2000 that played a major content developing role in Limburg’s transition.

Genk’s economic diversification focused on moving away from the past and looking into the future; however, the key to success was embracing its past. Boutsen continues:

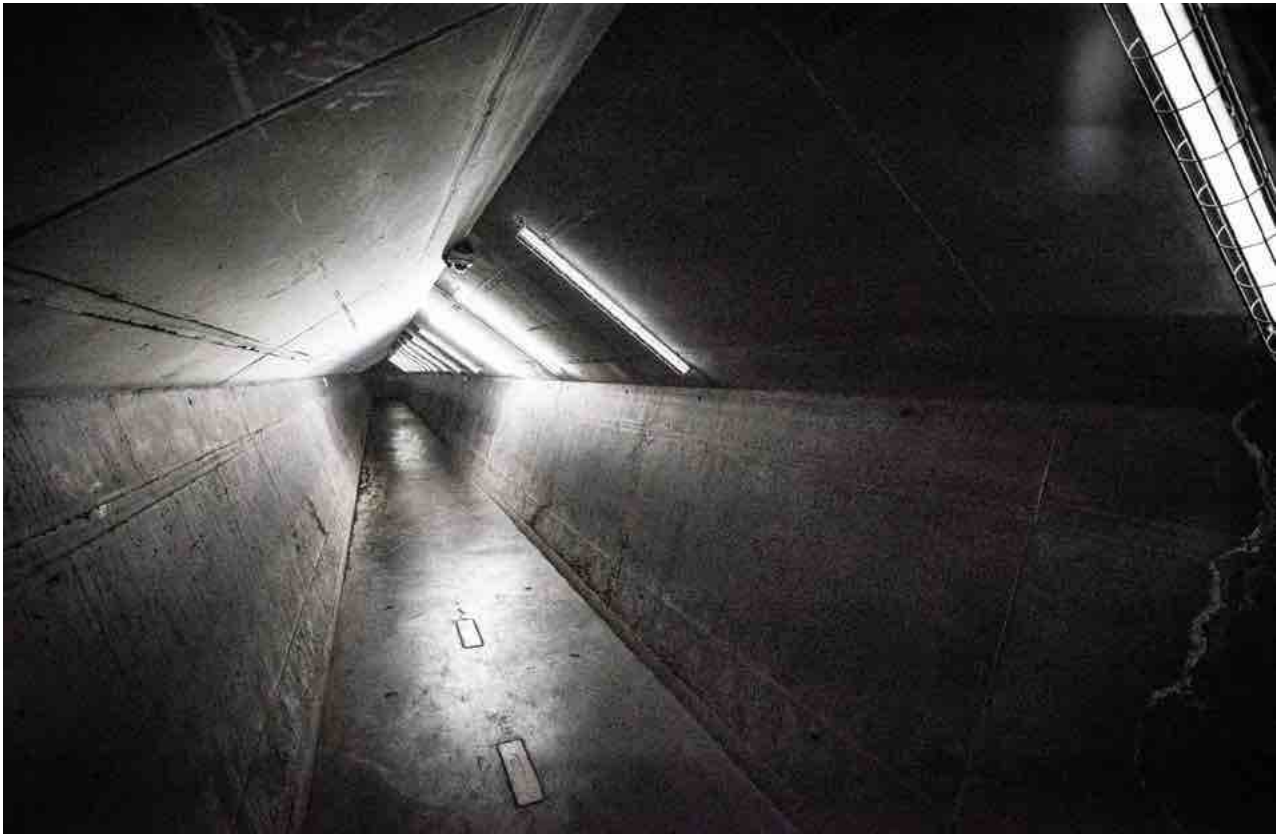


4. Thor Park, on the location of an old mine in Genk, Belgium. Photo: Berber Verpoest for Bankwatch

5. Reinterpretation of old mining tunnels by contemporary artist at C-mine, Genk, Belgium. Photo: Berber Verpoest for Bankwatch

6. GreenVille, tech hub on site of old mine in Belgian Limburg. Photo: Berber Verpoest for Bankwatch

7. GreenVille, tech hub on site of old mine in Belgian Limburg. Photo: Berber Verpoest for Bankwatch



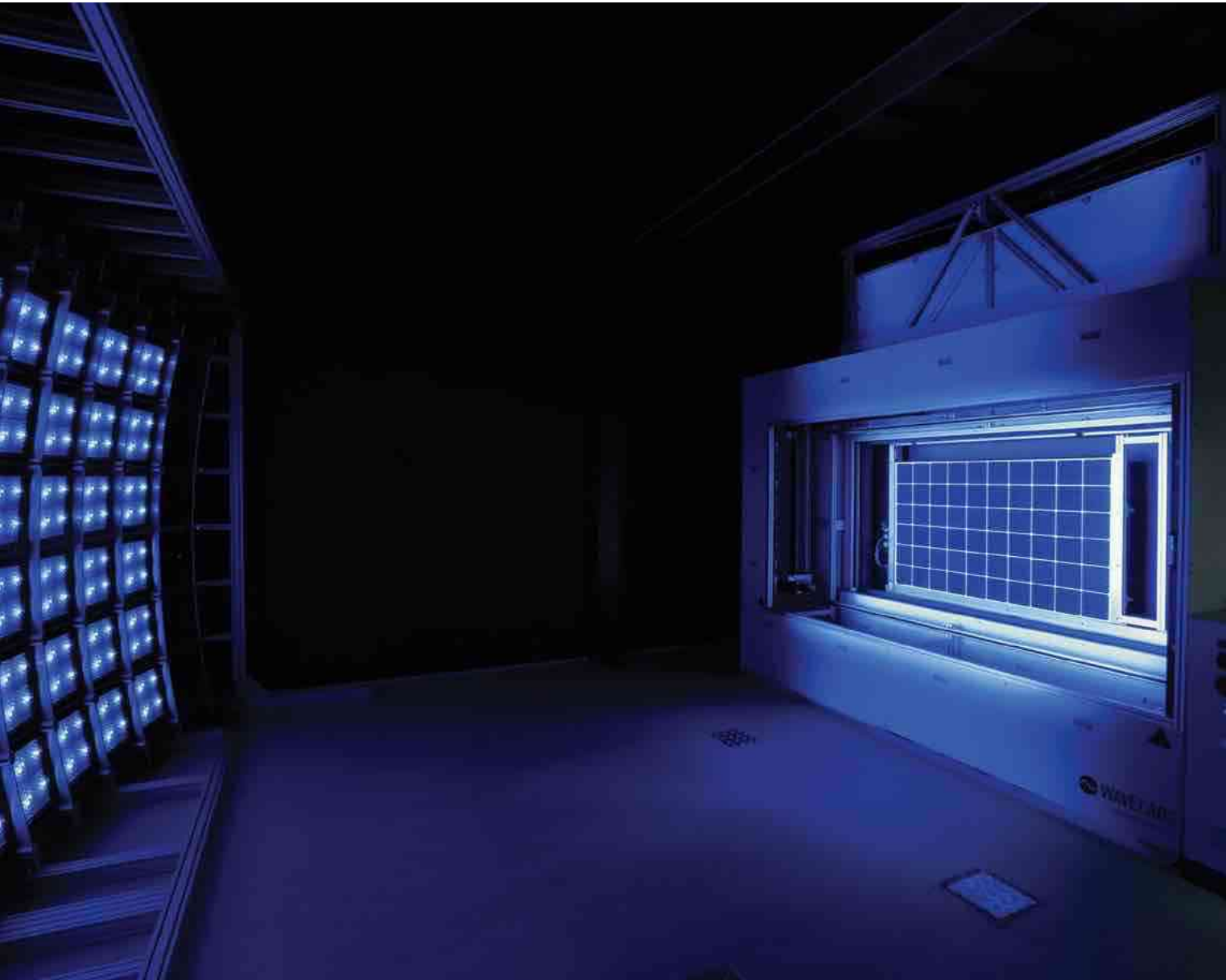
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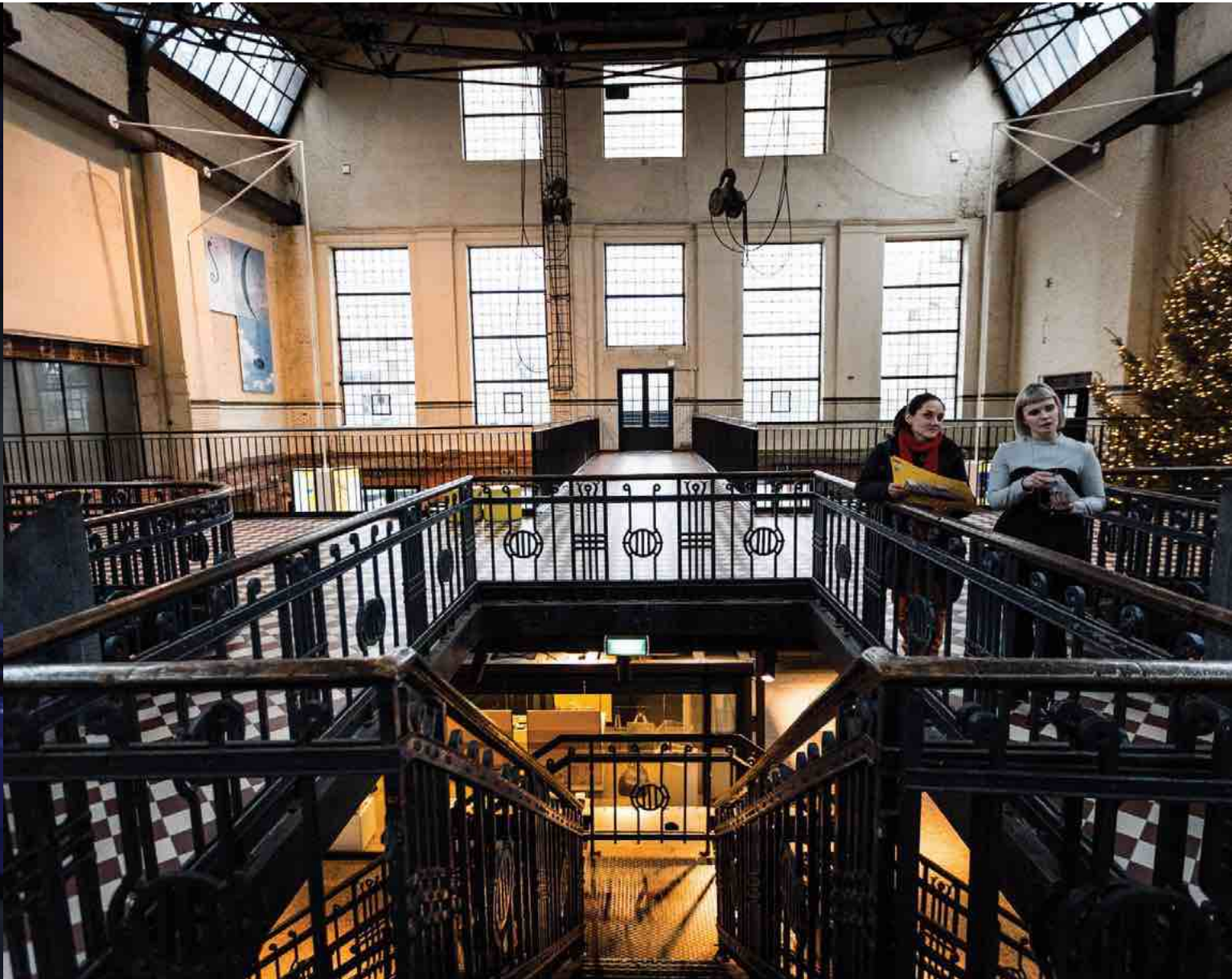
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7



8



9

“One of the key factors for success was that we finally managed to embrace our own heritage and culture as a driving force to communicate with everybody and build a new image for the region. It also helped us to see our heritage as an asset and take advantage of what was available to us. You have to start with what you have today. And what we had was a rich cultural heritage, infrastructure, and skilled people who want to and can work.”

Various levels of local authorities had different thoughts on how the transformation could be implemented and agreeing on a common plan for regional redevelopment was difficult. One of the greatest challenges was to save the former mining facilities from being demolished. It was key to get decision-makers to see the old coal mining infrastructure as an asset that could bring them forward, rather than as an obstacle that needed eliminating.

The sites, such as the Waterschei coal mine, had been left abandoned and in decay for many years since it closed in 1987. Despite only entering the discussion decades after the mines closed, the protection of coal mining heritage and infrastructure became one of the main guiding principles of this transition phase, taking advantage of opportunities that currently existed in the local area.

“Representatives of cities and regions we talk to agree that we face a historical turning point, and they are ready to shape the transformative process in partnership with all relevant actors,” states Carsten Rothballer, Coordinator, Sustainable Resources, Climate and Resilience at ICLEI – Local Governments for Sustainability. “It is a once in a life-time opportunity for elected leaders to access and mobilize substantial funding for an

inclusive and affordable sustainable energy supply.”

The transformative process mentioned by Mr. Rothballer can be seen in Genk through various projects that focus on heritage and the re-use of the mining sites. Three projects, all related to the conversion of decommissioned coal mines, have been of particular focus in Genk. One of the revived places is Thor Park, situated in the former

8. PV technology research at EnergyVille. Genk, Belgium. Photo: Paulien M

9. C-mine, old mine in Genk turned cultural center. Belgium. Photo: Berber Verpoest for Bankwatch

Waterschei coal mine, which is now a symbol of transition from coal mining to green energy. This former mine once employing 7,000 people, it is now a 93-hectare technology park and a hotspot for technology, clean energy and innovation, hosting companies in the fields of research and development, innovation, business, talent development and urbanization.

Another impressive example is the Zwartberg mine. It has been converted into a business park that hosts primarily SMEs and local entrepreneurs, and houses a public garden, an art studio and a research park on biodiversity, known as La Biomista.

The C-Mine, in the former Winterslag coal mine, functions as a creative hub and cultural center, where the focus is on education, creative economy, recreation, and art. It includes a cinema, a theatre, and a faculty of the Luna School of Arts, as well as space for events, and it is considered an incubator center for start-ups. It also attracts tourists with its unique virtual tour of the former mining site.

Today, Genk has successfully shifted from a mining to manufacturing and knowledge economy and is – together with the surrounding region – an example of redevelopment of industrial and mining infrastructure. Instead of

demolishing the already existing mining facilities, the examples above demonstrate how to create a unique landmark that respects heritage as an important part of regional history, transforming heritage spaces into modern workplaces.

It has to be acknowledged that, despite the progress made, the region still faces re-employment challenges for those whose skillsets have been made obsolete due to the closure of the automotive industry and the coal phase-out.

European coal regions are working together

Limburg is an active participant in the European Commission’s Platform for Coal Regions in Transition that was launched in 2017 to assist these regions in changing times. The Deputy Director of the Directorate General for Energy of the European Commission, Klaus-Dieter Borchardt, highlighted that “the regions need to adapt to a new era,” adding that the Platform was established “to help regions on the ground to undertake the transformation with concrete projects.” The Platform offers regions a space to build relationships

and foster cooperation, to develop support materials and case studies, and to get technical assistance on strategy development and project identification.

Paul Boutsen, who presented Limburg’s success story to a broad range of stakeholders during one of the Platform’s working group meetings in Brussels, reflected: “I met people from Silesia (Poland); we have put projects on the table and we will soon start working together on a project to create syngas and hydrogen out of the energetic fraction of municipal waste.” He praised the Platform’s role in creating this momentum and facilitating exchange,

adding, “People’s enthusiasm to share their knowledge is growing and regions will soon start writing and developing projects together.” ●

10. C-mine, old mine in Genk turned cultural center. Belgium. Photo: Michiel Hendryckx

11. Mining museum nearby Heerlen, The Netherlands. Photo: Berber Verpoest for Bankwatch

12. Paul Boetsen, independent consultant who played an important role in reconversion of mining sites in Limburg, Belgium. Photo: Berber Verpoest for Bankwatch



Lisbon: A Capital Green Dream

WRITER & PHOTOGRAPHER: FILIPA ROSA

A global pandemic overtook the world the year Lisbon won the EU Green Capital award. Ironically, this fact, plus the unprecedented massive shutdown of the capitalist machine, unveiled a somewhat « greener » cityscape than what anyone would have dared to dream.



In spring 2020, scents returned to the city of Lisbon. I can smell the sea as I open my window, and I can smell green. I cannot recall the air being this thin, this light... Which contrasts greatly with the concern I try not to feel within. Smells and sounds travel freely a great distance to visit us in our city center apartment. Instead of the usual car horns of hurried parents and nervous truck drivers, I wake up with the chirping of the swallows as the first rays pour down the hill.

Lisbon has accidentally (although temporarily) won a greener capital. To this special experience and to the desires it has awoken in me, I will refer to as the Capital Green Dream (CGD).

A port that receives everyone (but everything?)

Lisbon is “a port that receives everyone” says José Sá Fernandes, City Councilor for Energy and Green Structure in the promotional video on the EU Green Capital Award. But in the spring of 2020 the port is closed. There are no massive cruise ships on its shore and no planes drawing fume lines on the sky. This time, tourists are not filling up the tram 28, and billions of selfies are spared coming into existence.

With the great close-down caused by COVID-19, this spring air quality in Lisbon has reached levels never recorded before. And “Lisboetas” (the name given to its citizens) gained

a lot more city space. They can find quiet places in the city to enjoy life, to read a book or go to museums, visit monuments and appreciate neighborhoods without the constant maddening euphoria of a kind of tourism too avid to consume everything and anything all the time.

The frantic tourists had magically disappeared as did most forms of entertainment of the modern cities, from nightlife in bars and clubs, to cinemas, shopping centers, football matches, festivals, concerts, and gatherings of all sorts. More unbelievable still was to see the suppressing of most outdoor advertising.

We are all too aware now of the effects of over consumption: the depleting of natural resources in the run for ‘more’ and ‘faster’, the sheer waste generation

and the lack of real solutions to deal with the end-of-life of consumer goods, the effects of industrial and transport pollution in atmosphere and water... This is why a “Green Capital” that strives and thrives for sustainability cannot begin to exist in a society that is motivated by the wanton consumerism of capitalism. Instead, it must address them openly and actively.

Green and Purple

In Lisbon the Jacarandas are blooming and the avenues, dressed in exuberant purple, give the city an air of fantasy land.

Lisbon has some stunning green urban spaces. Perhaps not in dimension, but in intricate beauty and plant diversity, particularly in the older gardens such as Parque Eduardo VII, Gulbenkian, the Botanical Garden, Jardim da Estrela, and the Belém Tropical Botanical Garden. Unlike more recently designed and built gardens and green areas which are often blunt, minimal, too sunny, too hot and monochrome, these older gardens retain that sense of love, generosity and attention from the gardener or landscape architect. A variety of plants, colors, odors show up and fade away as we walk up and down their winding paths.

A Capital Green Dream is an urban area that does not fail to build bridges and connections between its citizens and the mysteries and wonders of its nature.



2



3



4

1. View from Lisbon hilltop.

2. Lisbon Cruise Ship Terminal was inaugurated in November 2017. According to the ONG Zero, in that year Lisbon was the European port with most cruise ship traffic (115). In 2017 cruise ship emissions of sulfur oxides (SOx) on the Portuguese coast were 86 times higher than emissions from the car fleet circulating in Portugal (5100 tonnes compared to 59 tonnes, respectively). The emissions of sulfur oxides of the ships' chimneys form sulfate aerosols (SO_{4s}) which increase the risk of cardiorespiratory diseases and contribute to acidification in land and water environments. In absolute terms, Portugal ranks sixth among the European countries most exposed to sulfur oxide pollution from cruise ships, after Spain, Italy, Greece, France and Norway. As for European port cities, Lisbon is also the sixth most affected city after Barcelona, Palma de Mallorca, Venice, Civitavecchia (Rome) and Southampton.

3. Jacarandá trees in Rossio, Lisbon.

4. Statue with seagull in Parque Eduardo VII, Lisbon.

The No-Fest Fest

As all events, and most particularly the festivals, in parks and scenic areas were cancelled, these urban spaces returned to their more mundane usages. Families and friends gathering to meet in small groups with their rosé wine bottles and picnics prepared from home. Some go jogging or just lie on the grass sun-bathing and relaxing. An old romantic feeling returned to the parks of the city as shopping centers remain closed.

The city is temporarily exempt from the never-ending chain of festivals (the « fest of fest of fest... ») to stampede the parks with an often awkward excitement: alcohol selling vans, cotton candy in plastic bags, tons of sugar rolled into the very typical *churros* and *farturas* (a dough that floats in boiling oil and then is rolled and rubbed into sugar before serving), and the other dozens of paid entertainment everythings. Without these events, we are also spared that moment when, inadvertently, we attend the last show and watch a sea of plastic glasses, paper cups, paper plates, cutlery and straws, as well as lost balloons and confetti poppers covering the not-so-green-grass-anymore.

Billboards

This spring, it was not only air and noise pollution that have been drastically reduced. Street billboards went silent for a while! Advertising billboards were, almost exclusively serving health instructions, promoting proper social conduct and educational purposes.

As I was not having to fight against external voices, (phrases, slogans) adding noise to my mind, I heard my

own thoughts and my eyes strolled freely. I walked the city streets without having the thought of a *fast and comfy car* popping up of nowhere, or a *super bling-bling wrist watch*, or *some lace underwear posing on the perfect silhouette of a young girl's fleeting beauty staring with apathy in her expression*, or any other random (unwelcome and

Capitalism seemed to have been muted from the streets and this brought along a quietness, both to the cityscape and to the mind.

useless) stuff cropping up into my most personal and intimate space: my mind!

In the Capital Green Dream, the value of street billboards is acknowledged and accounted for as the private spaces of people's minds. For that reason, their usage is the concern and choice of citizens themselves. One can easily quantify the value of these spaces by just looking at how much private companies are willing to invest to doodle in their brain-washing messages. In a Capital Green Dream, those messages, if any, are geared towards social and sustainability goals such as education, art, culture and actual technical information.

The asphalt

Branding is a very powerful tool. Branding a city as « green » is no exception. In fact, it is partly through a thoughtful communication plan, that

a European Green Capital will achieve « increased international media coverage, a boost in local pride and increased foreign investment » which are some of the announced benefits of winning this award. Lisbon council (CML) chose the advertising agency Wunderman Thompson to take up the 75k allocated funds to brand its EU Green Capital Award. Alongside the slogan « Choose to evolve » (« Escolhe evoluir »), the agency developed a brand identity using the city name, whereby each of its letters (L-I-S-B-O-A) seem to grow from the earth upwards, mimicking the organic growth of plants and trees.

In cities a lot of the natural world is literally trapped below ground. Trees and weeds are often seen trying to break and pierce the pavements and the asphalt. To make sure « nature » does not interfere with the things we like to control, humans use all kinds of artifices. One of those artifices is the obsession with paving the ground where we dwell. To keep covering the earth with a composite made of petroleum, is to suffocate earth and its natural order.

A Capital Green Dream does not belittle this issue and tries to return breathing capacity to the earth below the city. The Portuguese pavement (“*calçada portuguesa*”) is a lesser evil, although slippery and often uncomfortable, it is a more permeable surface than cement or asphalt.

« Escolhe Evoluir »

In the past decade, the city center of Lisbon has become like a massive resort village with all kinds of exclusive dedicated services for tourists. It's all hopelessly empty now, at the moment when people start coming out of their

houses at the end of a two-month imposed confinement period. Souvenir shops filled up with a parody of traditional objects, any type of object with the Portuguese flag on it (Made in China), food experiments and deviations for a wow effect and a laugh, all of it with extraordinary prices by any Portuguese standard. Whole neighborhoods were transformed to feed on a loop system with no exit, whereby consumer-hungry tourists can happily spend their time and money and overflow their euphoria with fake-traditional products.

Today, it's all closed and I can't help thinking how useful it would have been if all this work force, this human intelligence, was now working towards thinking and creating a more sustainable city and planet instead of being in agony at home not knowing how to pay the bills or feed a child. As the government calls for resilience and asks for solidarity from

5. Calçada portuguesa.



its people in these hard times, it might be worth asking: what is everyone's Capital Green Dream?

For me, the Capital Green Dream builds its economy on solid and real needs: be it helping other humans, or creating

and inventing sustainable solutions for social, urban, ecological, health and educational issues; because those needs are urgent – rather than made-up by an industry to serve corporate profit – and they are endless and require we constantly adapt, assess, evolve. ●

The EU Green Capital Awards

Since two-thirds of Europeans live in cities and towns, improving the quality of life of their citizens while reducing their environmental impacts is a key to creating a greener Europe. Since 2010, the European Commission's European Green Capital Awards have been recognizing such pioneering cities under the “Green Cities-fit for life” slogan. Over the past years, the following cities have received this prestigious award:

- **2015:** Bristol, United Kingdom: the UK's greenest city was recognized for its efforts in greening its transport and energy sector and stimulating innovation to develop its green economy.
- **2016:** Ljubljana, Slovenia: Slovenia's capital received the award thanks to its efforts in switching to clean transport in the new pedestrianized city center. Ljubljana also significantly improved its waste and wastewater treatment while protecting and expanding its numerous urban green spaces.
- **2017:** Essen, Germany: the EGCA lauded Essen's efforts in building upon its industrial past to reinvent itself as a green city, with a focus on nature and biodiversity and integrated environmental management.
- **2018:** Nijmegen, the Netherlands: Nijmegen showed great progress in involving its citizens, entrepreneurs and knowledge institutions in the creation of a healthy and prosperous city. It also aims at becoming energy neutral by 2045 and “climate proof” by 2050.
- **2019:** Oslo, Norway: the Norwegian capital adopted a new approach to conserving its natural areas and restoring its waterway network, while encouraging eco-mobility and the circular economy. It aims to cut its GhG emissions by 50% by 2020 from 1990 levels and to achieve carbon neutrality by 2050.
- **2020:** Lisbon, Portugal : this year's Green Capital has been focusing on sustainable urban mobility, green growth and eco-innovation and sustainable land use.

In 2021, the Finnish city of Lahti will be the European Green Capital. Lahti is performing very strongly in terms of air quality, green growth and eco-innovation, governance and waste, and has made significant progress in encouraging sustainable transport, supporting nature and biodiversity and addressing water and noise challenges.

Let's REIMAGINE the Global FASHION Industry

An interview with Andrea Kennedy, Founder and Sustainability Lead of Fashionindex.com and Assistant Professor at LIM College in New York.

REVOLVE caught up with Andrea Kennedy who started Fashionindex.com in 1994. We learned a lot about the challenges and opportunities for circularity in the global fashion industry.

What led you to start Fashionindex.com more than 25 years ago? What does Fashionindex do?

Fashionindex started because I was at my first job working as a design assistant at Calvin Klein, and one of my responsibilities was sourcing materials. We spent a lot of time calling - asking for minimums, prices, countries of origin, and how long it would take to ship to our factories in Italy or China. After a while, I started imagining a directory that provides all this information in one place. Back then, we had Rolodexes, and they came with pre-printed cards arranged in alphabetical order. As I met with fabric supplier after fabric supplier, I used my cards and started developing categories for materials: black velvet went under V (for velvet), metal buttons went under B (for buttons) and so on.

The other designers loved my Rolodex, because it made their job much easier. There were seven floors in the company and I often had to run up and down to find my Rolodex because someone else was using it.

A few years later, I decided I should try and monetize my idea; so with the help of a techy friend, we purchased blank Rolodexes directly, made our own fashion-supplier cards, called it Fashionindex (Fashion and Rolodex morphed) and started selling them. At the time, everyone worked mainly by phone, with some emailing, but we decided to set up a website in 1994. Fashionindex.com was the first fashion-trade website in the industry, which really propelled us into the future. Still to this day, I have customers my age and older who say they only use Fashionindex.com for sourcing, since we were their first. We built a reliable following from the very beginning.

Our business shifted around 15 years ago as we started to understand the need to look closer at the impact of the materials we were sourcing and the supply chains that produced the materials, due to the urgent need for

sustainability. We started sourcing and recommending more sustainable sources to our customers – those that were fair-trade produced or those that were made with organic materials, for example, or products that were made in factories practicing improved energy and water management. We strived to help companies create plans to produce goods in the most responsible ways possible.

Over time, Fashionindex became known as a trustworthy source for sustainable suppliers, products and consulting. I still work at Fashionindex in creating carbon-neutral events and sustainability consulting, but now I am thrilled to teach courses for the sustainability minor at LIM College. I especially love teaching the Applied Sustainable Practices in Fashion, a course that I had the opportunity to develop, where student “green teams” partner with brands and create sustainable and circular action plans for those companies.

1. AK and speakers at Americas Society – Women and Sustainability. Photo: Paula Abreu Pita

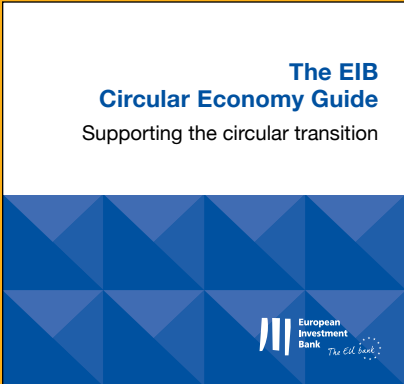
2. Fashionindex.com



R frameworks and R strategies for the Circular Economy

Whether reducing, repairing or repurposing, there are many ways to start and reinforce the transition towards a more circular economy. “Many authors view the various R frameworks as the ‘how-to’ of a Circular Economy and thus a core principle of it” explain the authors of “Conceptualizing the circular economy: An analysis of 114 definitions”. The most prominent of them might be the 3 R framework – Reduce, Reuse, Recycle - at the core of the 2008

Circular Economy Promotion Law of the People’s Republic of China. The EU Waste Framework Directive introduced ‘Recover’ as the fourth R. In May 2020, the European Investment Bank EIB updated its “Circular Economy Guide” which presents nine “R strategies” to be considered for investments into CE business models. One of the issues with the R frameworks: “Scientists are ... messing up because they use 38 different ‘re-’-words in these hierarchies, even the one’s using 3R’s or 4R’s do not refer to the same R’s”, as the authors of the brilliant paper “... Getting beyond the messy conceptualization of circularity and the 3R’s, 4R’s and more ...” explain.



3. In May 2020, the European Investment Bank published an updated version of its “Circular Economy Guide”.

R	Strategy	Description
R1	Refuse	Make product redundant by abandoning its function or by offering the same function by a radically different (e.g. digital) product or service
R2	Rethink	Make product use more intensive (e.g. through product-as-a-service, reuse and sharing models or by putting multi-functional products on the market)
R3	Reduce	Increase efficiency in product manufacture or use by consuming fewer natural resources and materials. It includes the prevention of food waste along food value chains including in agricultural production, processing, manufacturing, distribution and consumption
R4	Reuse	Reuse of a product which is still in good condition and fulfils its original function (and is not waste) for the same purpose for which it was conceived
R5	Repair	Repair and maintenance of defective product so it can be used with its original function
R6	Refurbish	Restore an old product and bring it up to date (to specified quality level)
R7	Remanufacture	Use parts of a discarded product in a new product with the same function (and as-new-condition)
R8	Repurpose	Use a redundant product or its parts in a new product with different function
R9	Recycle	Recover materials from waste to be reprocessed into new products, materials or substances whether for the original or other purposes. This includes the reprocessing of organic material but does not include energy recovery and reprocessing into materials that are to be used as fuels or for backfilling operations.

A further R strategy often mentioned in combination with the above 9Rs, sometimes even as part of a circular economy definition, is the recovery of (embodied) energy from waste and residues. The EIB acknowledges that from a waste management angle, energy recovery is an environmentally preferable option to landfill disposal in accordance with the waste hierarchy principle. However, the resource efficiency gains from waste-to-energy and waste-to-fuel strategies are limited compared to other 9Rs, particularly when considering the loss of value of potentially recyclable materials through combustion. Hence, the EIB does not consider activities primarily aimed at energy recovery from wastes and residues as substantially contributing to the circular economy.

In our interview, Andrea Kennedy shares her preferred R’s for rendering a more circular global fashion industry:

“**RESPONSIBILITY** is my favorite. We need to think about responsibility as our duty. We must act as stewards of the Earth. We are here momentarily. We have to create, produce and act responsibly. We are only guests on this earth, after all. We have no ownership here. Just as we take care and are thoughtful when we visit a friend’s home - we need to treat our earth responsibly and with...

RESPECT. How can the businesses we work for be respectful to all people, all beings, and the planet as well? How can each employee do their share in **RESTRUCTURING** our companies and organizations so our actions treat all people creating our products with respect – as well as source, ship, produce and sell within earth’s planetary boundaries - the source of the resources used to make our products. Nature is also the place to which products return to when we no longer need or want them.

REGENERATION. To regenerate and enrich nature is imperative. We must work to eliminate toxins and pollutants that destroy and hinder re-growth. In circularity, we have natural – biological and manmade – technical – components that create fashion items. It is important that all those material components be used again. Either by processes that include breaking down and regenerating materials to create new products, or for many of the biological components - if they have no toxic chemistry - they can be used for **REGENERATION**, and enrichment of the soil and planet.

RECONCILIATION. Before we undertake any of these actions towards circularity, we must understand the ways of the past that created the current issues, and reconcile them with our ecological systems. If we admit that biodiversity and nature matter, and we choose to live in harmony with all life types on earth, then we can move forward from the harmful impacts from sourcing, producing, and distributing products to the atmosphere, soil, water, land resources,

and many people and communities. We must **RESTORE** those relationships. In reconciliation, we systematically change how we think about the environments and places of our business. And part of that is known as...

REGIONALIZATION: in the fashion industry we work globally to benefit from economies-of-scale and cost. However, a regional approach means we apply place-based thinking to our supply chains and choose to keep production and next steps close to the place of material origin. This can mean domestic, or same hemisphere; but regionalization can also be global. Working regionally can include multiple production areas - all close to the multiple customer regions. Meaning that for each area - sourcing, production and selling are consolidated to that one geographic place. This decreases shipping impacts because multiple regions

4. Adam Brand, of M&S Schmalberg trim factory in midtown Manhattan, speaks to LIM College fashion merchandising students on the benefits of place-based and regional production. Photo: Andrea Kennedy



each create smaller lots of the same product. Here’s an example: according to EileenFisher.com, the typical yoga top travels seventeen thousand miles before it gets to the consumer. This great distance is due to where the thread comes from, the label, ink for printing the label, fiber, fabric, hangtag, etc., all come from different places around the globe. When we keep the supply chain regional, we increase accountability and transparency and reduce fuel, pollution, and emissions from large quantities of materials and components traveling and crisscrossing the world. This makes our apparel production more respectful to people and places, and helps us to...

REVERSE the human-caused impacts from globalization. If you’re unfamiliar with Will Steffen, Google him and you will find that he and his colleagues charted the Earth-systems and socio-economic trends. Their research shows that as globalization, GDP and production of materials rose, so did the injustices to the Earth’s ecosystems. The take-away from their charts is that business actions and profits have taken the same trajectory as human impacts on earth; and this is why we must **RECONCILE**, and **REVERSE**.

We personally may not have caused these impacts, but there is a great opportunity to draw those charted impacts down and make our companies planet-first, people-first, and future facing. When circularity principles and responsibility are built into the design and development phases of fashion goods production, the products cause less harm and have more value. Circular products must be made for:

REPAIR and **REUTILIZATION** to last longer. Both practices work towards keeping products in existence for as long as possible. Repair practices include old-world skills, such as darning, overdyeing, and needle-working. Hand-craftsmanship offers local employment opportunities and therefore has local economic benefits. That said, to accomplish this end, clothing must be designed to be easily repaired, disassembled, and created – and with quality materials. A great store in New York already doing repair work to their products is Nudie Jeans. Reutilization – also known as **REVALORIZATION**, allows for the recycling and reuse of materials and products that are then transformed into something new. Both are very important in terms of

circularity, and to do this we must **RE-IMAGINE**... which is my last but not least of the important “R” words in the fashion industry.

RE-IMAGINATION is about creatively and radically rethinking what products are made of, how they are made, and how they are used. Circularity is not only recycled or organic fibers in fabric. Circularity also questions if and how we need to buy and use this product - the **RE-ANALYSIS** of all the components. In our advanced sustainability courses at LIM College, for example, students work with fashion brands to create forward-thinking sustainable action plans with ten-year rollouts. We do a lot of reimagining in class in order to create these plans. The lessons help students become aware that it is the products and the ways we have made them that’s created the wicked problem fashion is now facing. The great part of re-imagination is that there are no right or wrong answers. Whether the tasks and responses include the sharing economy, new shopping processes, revised ways of packaging, low-impact shipping, easy repair solutions, offsetting, keeping carbon footprints low, or apparel that bounces back. Students

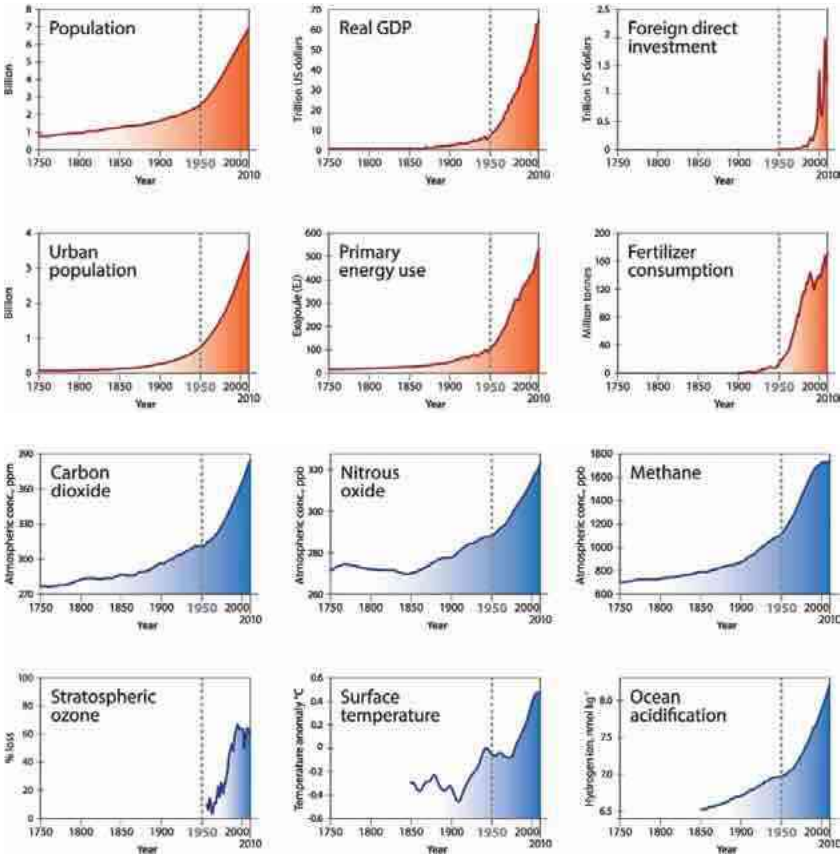
re-imagine ways to keep garments out of landfills, away from incinerators - and as such, become part of a more circular system. Once they have their wild concepts, we funnel and hone them into plans that work towards circularity and are feasible, relevant to the brand, accomplishable, and cost-efficient.

These are exciting times. We know for certain that circularity is achievable. Circularity is a characteristic of nature. We can and should emulate nature for success. Just as the Earth is round, so too can our product systems be circular. What seems like the end is also the beginning.” ●

Read the full interview:
● revolve.media/circular

5. Francy Altus, Director of Technical Design and Product Management Group welcomes LIM students to the Siskind Group showroom for a lesson on the importance of garment fit as part of their Sustainability and the Future of Fashion coursework. Photo: Andrea Kennedy

6. In January 2015, Will Steffen and colleagues published “The trajectory of the Anthropocene: The Great Acceleration”, in which they charted the Earth-systems and socio-economic trends - their research showed that as globalization, GDP and production of materials rose (red charts), so did the injustices to the Earth’s ecosystems (blue charts).



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