SEPTEMBER 2020

EE ENERGY EFFICIENCY MAGAZINE

Special Edition
EE and Economic Recovery

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GREEN ECONOMY FOR A GREEN RECOVERY

1. Suggest national, sectorial and regional energy efficiency plans for public institutions
2. Design and implement energy efficiency programs
3. Monitor, coordinate and supervise plans of development in energy efficiency
4. Develop and disseminate energy efficiency norms and labels for equipment and devices
5. Mobilize all necessary means and financial resources for the programs implementation
6. Monitor and coordinate energy audits and the implementation of their recommendations

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I. Introductory Letter

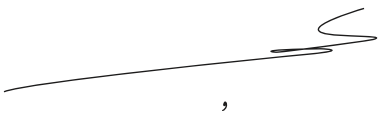
Introducing the Energy Efficiency Magazine

On behalf of the EE Global Alliance (EEGA) and the AOB Group, we are proud to issue this special edition of the **Energy Efficiency Magazine** focused on energy efficiency's role in global economic recovery. As COVID-19 continues to devastate economies around the globe, it is critical to highlight how energy efficiency solutions can support countries' rapid and sustainable recovery.

Because climate change remains one of the world's greatest challenges even during the pandemic - and will outlive the current health and economic crisis - we are releasing this special digital edition during Climate Week NYC, an event run by the Climate Group in association with the United Nations and the City of New York. In addition to helping countries get back on their feet economically, energy efficiency can provide more than 40% of the emissions abatement required by 2040 to meet the goals outlined in the Paris Agreement (IEA, 2018).

In this magazine, you'll read timely updates and ideas from a diverse suite of renowned international experts with one common theme: our collective global economic recovery efforts must prioritize energy efficiency. Authors reflect on lessons learned from recovery efforts following the 2008 Great Recession, the kinds of policies and programs needed to sustainably recover today, and the private sector's role.

We are excited to share this magazine with you.



Hafid Boutaleb
Business Research Manager
AOB Group

Laura Van Wie McGrory
Vice President, Strategic Initiatives
Alliance to Save Energy/EEGA

The AOB Group is an international publisher focused on energy and climate change. Since 2016, the AOB Group has issued the annual EE Magazine during the UNFCCC's Conference of Parties (COP).

The EEGA—an international coalition of government, corporate, and NGO energy efficiency leaders—was launched by the Alliance to Save Energy in 2019 with the mission to support accelerated investment and implementation of energy efficiency solutions to meet global climate goals.

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Cardiff, Wales, UK

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I. Energy Efficiency: A Key Economic Recovery Strategy

- The EU needs to learn from what happened with the last crisis and show the world how to pursue recovery while cutting energy consumption and related emissions.

Energy Efficiency in Recovery Plans Gives Europe an Ace up its Sleeves for Both Today's and Tomorrow's Challenges

Monica Frassoni
President, European Alliance to Save Energy (EU-ASE)

Crucial for climate mitigation, energy efficiency should be a key focus area in Member States' stimulus programmes. This would greatly benefit the bloc's economy, while setting the EU on the path to becoming a leading player in global markets.

European Union governments are in the process of designing massive stimulus packages to sustain socio-economic recovery following the devastating impact of COVID-19. The plan is to develop spending programmes large enough to bring the economy back on track, while at the same time ensuring that investments are aligned with Europe's sustainable economic growth strategy as outlined by the European Green Deal.

Against this backdrop, it is useful to look back at the last time when major public stimulus plans were implemented: the global financial crisis of late 2008. As IEA's Fatih Birol has rightly recalled, the extra spending on clean energy following the 2008 crisis contributed positively to economic recovery. Recovery was also made possible through energy efficiency programs which supported a construction sector hard-hit by the crisis. However, that recovery was energy and carbon intensive: global CO_2 emissions declined by 400 million tonnes in 2009, but they rebounded by 1.7 billion tonnes in 2010 in the sharpest upswing in history. This cannot be repeated in a decade which is crucial to mitigating the effects of climate change and preventing the irreversible effect of dramatic temperature rise. This is even more true for Europe, since the bloc has pledged to achieve climate neutrality by 2050. **The EU needs to learn from what happened with the last crisis and show the world how to pursue recovery while cutting energy consumption and related emissions.**

Here are a few reasons why energy efficiency policies should be among the key areas of national and European stimulus programmes.

First, **energy efficiency is paramount for climate mitigation: through existing technologies, it is possible to**

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- Energy efficiency is paramount for climate mitigation: through existing technologies, it is possible to reduce energy consumption, increase the efficiency of the entire energy system and accelerate the integration of renewables.

reduce energy consumption, increase the efficiency of the entire energy system and accelerate the integration of renewables. According to the IEA, 76% of the European greenhouse gas emission reductions required to keep temperature increases below 1.5°C must come from energy efficiency.

Secondly, from an industrial point of view, energy efficiency has great added value as its value chain is deeply European. In fact, Europe hosts some of the most innovative and successful energy efficiency companies in the world. The members of the European Alliance to Save Energy are global "champions" that export technologies and drive innovation. Hundreds of other players, especially small and medium-size enterprises (SMEs), also operate in this field locally across the continent.

Investing in energy efficiency also means investing in European innovation, especially when it comes to the construction sector. According to data from the European Patent Office, green construction-related patent filings have tripled in a little over a decade. These include technologies for energy-efficient insulation, "green" lighting, and incorporating renewable energies in buildings.

If Europe develops a technological leadership in energy efficiency, it will have a strong competitive advantage helping with access to global markets. Indeed, innovations developed in Europe and investments in more efficient and ecologically friendly buildings will pay back quickly with dividends and millions of well-paying, local jobs.

This explains why energy efficiency is a 'must have' in government stimulus programmes. EU Heads of State and Government have agreed to provide the Union with the necessary means to address the challenges posed by the COVID-19 pandemic and decided to mobilize 750 billion EUR to be committed by end of 2023. Member States should seize this opportunity and invest without hesitation in efficiency projects at national and local levels.

While the 30% climate target for the expenditure of these resources is a step in the right direction, EU governments should agree on clearer rules and stringent green conditionalities for qualitative use of recovery funds. Additionally, resources should be earmarked for investments in sectors with high potential, like construction.

It is time for Member States to fully implement the energy efficiency first principle to avoid new costly energy infrastructure that would jeopardise EU efforts to reach climate neutrality by 2050. Finally, Members should modernize their economies to increase resilience and tackle climate change impacts without delay.

This would bring great economic and social benefits in the short term and contribute to protecting the environment in the long term.

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I. Energy Efficiency: A Key Economic Recovery Strategy

- Energy efficiency investments as part of stimulus packages represent an opportunity for governments to achieve their recovery goals while supporting the clean energy transition.

COVID-19 Recovery: The Power of Energy Efficiency to Jump-Start Economic Stimulus

Alyssa Fischer
Energy Efficiency Analyst, International Energy Agency

Over the course of 2020, countries around the world have felt the devastating impacts of COVID-19, including loss of life, skyrocketing unemployment, and the closure of small businesses. In response, governments have been hard at work developing and implementing rapid response plans to safeguard the health and well-being of their populations while stemming job losses and creating new opportunities. **Energy efficiency investments as part of stimulus packages represent an opportunity for governments to achieve their recovery goals while supporting the clean energy transition.**

IEA's analysis of the role of energy efficiency in recovery packages from years past indicates that considerable shares of stimulus spending will be put toward building, construction, and infrastructure initiatives, as well as programs to incentivize large purchases, like cars, appliances, and other energy-using technologies. Integrating energy efficiency principles into these types of programs has been shown to create jobs across the economy, especially in labor-intensive sectors like construction and manufacturing and at small and medium-sized businesses. In fact, the IEA's Special Report on Sustainable Recovery found that every USD 1 million of investment in energy efficiency measures creates around 10-15 jobs. Well-designed recovery programs can support this existing workforce and create new opportunities. The IEA's Sustainable Recovery Plan outlines policy measures and investments that could boost global economic growth by 1.1% per year and save or create 9 million jobs per year while reducing global carbon emissions. About one third of new jobs would be created through investments in energy efficiency.

These energy efficiency investments can take a variety of forms. In the buildings and construction sector, energy efficiency improvements in housing, schools, hospitals, and government buildings can be effective at creating new jobs, with around 60% of the funds spent on home energy efficiency retrofits going towards labour.

Investment in infrastructure such as smart grids, public transportation systems, street-lighting, electric vehicle charging networks, and next-generation digital networks can create jobs while accelerating the transition to sustainable,

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- Investment in infrastructure such as smart grids, public transportation systems, streetlighting, electric vehicle charging networks, and next-generation digital networks can create jobs while accelerating the transition to sustainable, low-carbon energy systems of the future.

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For example, India's National Street Lighting Programme upgraded approximately 11 million streetlights with efficient LEDs, delivering greenhouse gas emissions reductions of 5 million tonnes per year while creating around 13,000 jobs.

Additionally, technology replacement programs that provide incentives to consumers to replace old, inefficient products can improve consumer efficiency at scale while encouraging consumer spending, leading to jobs in the recycling, manufacturing, transport, and retail industries. For example, in Colombia in 2017, a program to replace one million inefficient refrigerators with new models that used 25% less energy delivered lower energy bills for consumers and reduced demand for energy subsidies among low-income households. An estimated 12,000 jobs were created by the program.

Energy efficiency projects are often "shovel-ready," cost effective, and improve economic competitiveness and resilience in the long-term, making them ideal for sustainable recovery from the COVID-19 pandemic. The wide range of short- and long-term opportunities presented by energy efficiency means that there is a solution suited to every type of community, city, or country.

Leaders around the world have realized the unique value of energy efficiency; for example, the Global Commission for Urgent Action on Energy Efficiency is a coalition of global leaders from the private and public sector who have developed a comprehensive set of 10 adaptable recommendations based on best practices from around the world. Early, decisive action to integrate energy efficiency into every aspect of a recovery plan will be essential to maximize all potential benefits available. The inclusive, sustainable, and prosperous future the world needs depends upon it.

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- Building back better entails putting people at the heart of recovery plans, especially those who are currently most vulnerable; creating more jobs while pulling people out of poverty; and building resilience to future crises

Charting a New Course: Aligning Climate, Efficiency, and Economic Development

Jennifer Layke
Global Director, Energy Program, World Resources Institute

COVID-19 has resulted in immense loss of life, and has caused unprecedented damage to global economies: the coronavirus pandemic's impact on jobs has been 10 times bigger than that of the 2007-2008 global financial crisis. Young people, women, and low-income households have been disproportionately affected by the economic stress of the pandemic. Governments around the world are scrambling to stem the crisis: it's estimated that $9 trillion USD has been spent globally on fiscal emergency response measures. Some of these will have a long-term influence; however, only a handful of governments have announced intentions to implement plans beyond immediate economic relief.

As countries spend money to recover – and to get people back to work – they have an opportunity to break free from investing in fossil fuel-driven growth, which threatens human health and exacerbates inequality. Instead, they can stabilize financial markets and economies by building back better. Countries can take advantage of low-carbon investment opportunities to reduce GHG emissions and air pollution while rebooting economies. Additionally, and importantly, **building back better entails putting people at the heart of recovery plans, especially those who are currently** most vulnerable; **creating more jobs while pulling people out of poverty; and** building resilience to future crises.

This is where the energy sector comes in. Energy has played a critical role in the response to COVID-19. In places where there is reliable energy, essential items continue to be delivered, hospitals have been able to provide care, and millions of people have been able to work and study from home while maintaining social contact online. We already know that transforming the energy system and investing in renewable energy and energy efficient buildings is imperative to meeting climate targets and keeping the planet cool. We also know that before the pandemic, jobs in the clean energy sector – particularly in energy efficiency – were growing fast. Emissions would have been 60% higher without 40 years of investment in energy efficiency, and consumers would be paying $800 billion more per year in energy costs.

Here are just a few ways energy efficiency programs can help

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- Energy efficiency investments have the potential to increase global economic growth by 1.1% each year, raising the global GDP 3.5% higher in 2023 than it would be otherwise.

contribute to building back better, according to the IEA's Sustainable Recovery Plan:

- **Growing economies:** Energy efficiency investments have the potential to increase global economic growth by 1.1% each year, raising the global GDP 3.5% higher in 2023 than it would be otherwise.

- **Creating jobs:** Building back better could save or create nine million jobs per year, with the largest number of new jobs in energy efficiency (35%) and another 25% in power systems, particularly in wind, solar, and electricity grid modernization. Many of these new jobs would be specialized and technical, requiring training programs.

- **Building more resilient and cleaner energy systems:** According to the IEA, if governments choose to build back better by investing in efficiency and renewables, annual energy-related GHG emissions will be 4.5 billion tons lower in 2023 than they would be otherwise. 2019 would be the definitive peak in global emissions, with energy efficiency measures delivering the largest overall emissions reductions.

Long-term investment in the global energy sector makes countries more resilient to future crises. Now is a critical moment for governments to build back better and secure the future of their energy systems, the livelihoods of their citizens, and the stability of their economies.

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Energy Efficiency Reduces Waste, Cuts Carbon and Can Get Canadians Back to Work After the Pandemic - Just Ask Your Aunt Mary

Corey Diamond
Executive Director, Efficiency Canada

Shuttering many businesses and putting millions out of work, COVID-19 threw a serious wrench into Canada's economy. As the country begins to rebuild its economic prospects, energy efficiency investments have many benefits including job creation that necessitate a closer look.

Shawna Henderson, CEO of the training company Blue House Energy in Halifax, Nova Scotia is a veteran in energy efficiency, having worked in the industry since 1991. In 2001, as a single mother, she began training people in energy efficiency and related construction fields, driving herself and her kids around her home province until she eventually decided to take her business online. She launched Blue House Energy's online education platform in 2012.

Henderson said that even before COVID-19, the largely male workforce that builds and retrofits buildings was dwindling because many current workers are retiring and there are fewer people to replenish their ranks. Her online platform saw an increase in interest during the pandemic, and in the wake of COVID-19, Henderson said she hopes that Blue House can help train the next generation of workers in the field, particularly women and people of colour.
"There's so much that could be done with a rising workforce that could carry out significant retrofits," Henderson said.

At Efficiency Canada – a Carleton University-based organization of which I am the executive director – we advocate for energy efficiency businesses like Blue House Energy. Through our advocacy, we connect workers in the field and help raise their profiles through campaigns like Our Human Energy, which tells stories of energy efficiency workers like Henderson.

Creating jobs and helping Canadian businesses is one of the pillars behind energy efficiency, and our work at Efficiency Canada. But there are many other reasons to champion it as a cause. Countless buildings across the country need upgrades and retrofits. For example, schools urgently need upgrades to heating, ventilation, and air

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- After a summer full of air conditioner use and before Canada's cold winters, energy efficiency can help reduce people's electrical and natural gas bills.
- Besides cutting costs and unemployment, energy efficiency can also cut emissions, an important move as Canada works to meet its climate goals. Improvements in energy efficiency can account for 40% of the reductions committed to in the Paris Agreement, making it the "cheapest and most abundant source of energy," in Canada, according to a statement from the Office of the Minister of Natural Resources Canada.

conditioning systems to protect against the spread of COVID-19 in winter, while making them more comfortable places to learn. **After a summer full of air conditioner use and before Canada's cold winters, energy efficiency can help reduce people's electrical and natural gas bills.** This is especially important considering how many households took a hit to their savings and saw an increase in energy bills, or slipped into energy poverty during the pandemic, as it allows Canadians and Canadian businesses to save money that could otherwise be used on other necessities.

Besides cutting costs and unemployment, energy efficiency can also cut emissions, an important move as Canada works to meet its climate goals. Improvements in energy efficiency can account for 40% **of the reductions committed to in the Paris Agreement, making it the "cheapest and most abundant source of energy," in Canada, according to a statement from the Office of the Minister of Natural Resources Canada.** During a respiratory pandemic, we should all be thinking about lowering emissions and air pollution.
"Here in Canada, it's going to help us go beyond Paris 2030 and get to net zero by 2050. Improvements in energy efficiency enable Canadians to fight climate change in a way that's accessible to them," the statement read.

As an important part of the country's recovery plan, the federal, municipal, and provincial governments of Canada need to work to create long-lasting, coordinated energy efficiency policies. Governments and businesses should also work to develop more funding models like grants and low-interest financing.

According to research by ECO Canada, in 2018, around 436,000 Canadians were employed at energy efficiency businesses.

This number surpassed two other huge sectors in the country: mining, quarrying, and oil and gas (204,000 people) and telecommunications (123,000 people). That's a significant chunk of our economy, and therefore our economic recovery.

It's also not just construction workers and insulation installers working in the field. For instance, Henderson's company – made up of six full-time staff and a few dozen contractors – employs administrators and people working in creative fields.

The bulk of energy efficiency workers are also employed by small, local businesses: the kinds of businesses that have struggled the most to weather the pandemic.

In the end, energy efficiency is the mom and pop shops, and your aunt Mary who runs an insulation business in your town. Local jobs are at the core of it. Investments in energy efficiency now will help us build the secure and healthy future we want for ourselves and our families: let's start building back better, today.

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- For essential businesses, manufacturers, and schools, energy efficiency investments can help reduce costs at a time when our local economies are struggling and organizational budgets are being watched closely.

Energy Efficiency: The Pathway to Economic Recovery in the U.S. Midwest

Stacey Paradis
Executive Director, Midwest Energy Efficiency Alliance

Throughout the last decade, energy efficiency has been the quiet workhorse in the United States' Midwestern region: Saving consumers and businesses money, reducing emissions, and positively impacting communities – urban, suburban and rural – across the region.

In 2020, the Midwest was expected to have invested $1.87 billion in energy efficiency, and to save 8 million MWh of electricity and 164 million therms of natural gas throughout the calendar year.

Since 2010, more than $17.5 billion has been spent on energy efficiency, helping families and businesses save energy and lower their bills while creating local jobs. As of early 2020, clean energy companies employed more than 744,000 people in the Midwest, adding 7,500 new jobs in 2019 alone, according to Clean Jobs Midwest. Of those jobs, 534,567 were in energy efficiency, representing more than 70% of all clean energy jobs.

Unfortunately, the COVID-19 pandemic has been devasting to our industry. Through May 2020, 131,660 Midwest clean energy workers have filed for unemployment; 91,992 of those were energy efficiency workers.

So how can energy efficiency be the pathway to economic recovery?

Energy efficiency is a labor-intensive industry. It requires individuals with different skill sets, education levels, and backgrounds to work together at different segments of the supply chain. Utilities and partners need to create innovative solutions for customer programs with new safety measures due to the pandemic. Contractors need the resources to be able to reach these customers, whether a single-family home, commercial business, multifamily building, or larger industrial facility while prioritizing the safety of the employee and customer. At each point, there is an opportunity for more job creation within the community being served. Energy efficiency programs are also nimble and can be targeted to benefit communities most impacted by the virus.

This work also creates an immediate impact. Energy efficiency upgrades within homes decrease energy use, increase comfort, improve indoor air quality, and reduce monthly bills when people need it most. **For essential businesses, manufacturers, and schools, energy efficiency investments**

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- For every dollar invested in energy efficiency, consumers get back $2-$3 in energy savings benefits, which they can then spend in other ways to ignite economic activity.

can help reduce costs at a time when our local economies are struggling and organizational budgets are being watched closely. For every dollar invested in energy efficiency, consumers get back $2-$3 in energy savings benefits, which they can then spend in other ways to ignite economic activity.

Looking toward the future to clean energy goals

Energy efficiency is also a key component in a clean energy future. As many municipalities, cities, and states are establishing clean energy goals, energy efficiency cannot be ignored in plans to meet energy demand within an achievable investment.

Energy efficiency has also long been the leading employer in the clean energy economy, and for a good reason. These jobs are local, hired within the same community they are benefiting, and long-lasting. As long-term plans take shape, there is a significant opportunity to get people back to work.

Bills on the table

There are many bills at play at the federal and state levels to help revitalize the energy efficiency industry. Sustainable infrastructure and clean energy need to be at the forefront of recovery packages, as these stimulus efforts will spur rebuilding efforts in communities across the Midwest and the country and ensure progress toward meeting climate goals.

During the 2008 recession, energy efficiency was a key component of the American Recovery and Reinvestment Act, stimulating investment across the country to create jobs and opportunities for innovation.

$2.86 billion was allocated to the Midwest for weatherization, state energy programs and energy efficiency and conservation block grants at that time. As we debate support in response to the pandemic, we need to ensure that government dollars complement existing utility programs to ensure maximum energy savings and positive economic and environmental impact starting in 2021.

As we look toward economic recovery, we need federal, state, and local governments to support our industry and work with us on a path forward to ensure that energy efficiency investments continue in 2020 and beyond.

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- The United Nation's Sustainable Energy for All (SEforALL) Energy Efficiency and Renewable Energy Accelerators are potential enablers that can help developing economies increase electricity access rate while tapping into huge energy efficiency potentials.
- Introduction of energy performance standards and labeling regimes that ensure efficient appliances are used can save money and energy for families in need.

COVID-19 Recovery through SEforALL's Energy Efficiency & Renewable Energy Accelerators

Kofi Agyarko
Director of Renewable Energy, Energy Efficiency & Climate Change (REEECC) - Energy Commission, Ghana

The global economy has been shaken by the sudden advent of COVID-19. Both developed and developing economies have experienced disruptions to their Gross Domestic Product with its attendant problems like unemployment. However, there is a silver lining beneath the pandemic clouds as it presents a chance to change from business-as-usual to a more aggressive and innovative way of doing things. **The United Nation's Sustainable Energy for All (SEforALL) Energy Efficiency and Renewable Energy Accelerators are potential enablers that can help developing economies increase electricity access rate while tapping into huge energy efficiency potentials.**

The three action pillars of SEforALL – ensure universal access to modern energy services, increase the share of renewable energy in the national energy mix, and increase the national rate of improvement in energy efficiency – as supported by specialized accelerators could facilitate a speedy recovery from the negative impacts of COVID-19 in the micro- and macro-economy. The health sector is the most impacted by COVID-19, and countries have had to spend more to either maintain the quality of their health care delivery or improve it to ensure high recovery rate for patients. Access to reliable and affordable electricity is therefore crucial to managing this pandemic. One way by which SEforALL accelerators could support developing countries in increasing access to electricity and modern energy services is by facilitating adoption of more affordable and durable renewable energy and energy-efficient technologies. This could support rural populations to be actively involved in economic activities like production and processing of food products and raw materials for industries.

Energy efficiency can also reduce costs in underserved communities. Cooling, ventilation, refrigeration, and heating appliances are among the highest consumers of electricity in the residential, commercial, and industrial sectors. **Introduction of energy performance standards and labeling regimes that ensure efficient appliances are used can save money and energy for families in need.** Support for cooling appliances in homes under the United for Efficiency (U4E) accelerator could be especially timely for beneficiaries who may be

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spending more on electricity as a result of various "Stay Home" directives. Other energy efficiency Accelerators could provide additional support in the form of grants for consumer and supplier finance schemes to facilitate purchase of these more efficient appliances.

Education is another sector that is hard hit by the COVID-19 pandemic. Most schools around the globe are still shut and classes have migrated to virtual platforms. The equity gap has been further widened because virtual learning platforms are mainly accessed via internet on electrical and electronic devices like computers. For pupils and students in off-grid communities, the situation is further compounded by lack of good lighting for studying at night. Renewable energy and energy efficiency accelerators could support recovery in the education sector by supporting the transfer of more affordable off-grid lighting and low power consuming learning devices to support learning activities. Lighting accelerators could also facilitate access to affordable energy-efficient lamps and control devices like motion sensors by households and businesses. Finally, in industry, Accelerators working on energy management systems (EnMS) could facilitate the rapid transfer of best practices, innovations, technologies, and tailored-financing mechanisms to enhance viability.

Children studying with rechargeable lantern

The pandemic, though a global crisis, presents opportunities that SEforALL energy efficiency and renewable energy accelerators could harness to expand their portfolio, reach, and visibility. Governments, policy makers, businesses and consumers are more likely to be receptive to energy efficiency interventions that promise significant returns on investments and savings from the "electricity generated" at the national level. This is a great time to act – fast, big, and with a bang.

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I. Energy Efficiency: A Key Economic Recovery Strategy

- If ever there's a right time to create a circular, sustainable, and highly competitive economy, it is now.

An Interview with Bertrand Piccard, an "Inspioneer" For Efficient Solutions

Bertrand Piccard
Initiator and Chairman, Solar Impulse Foundation

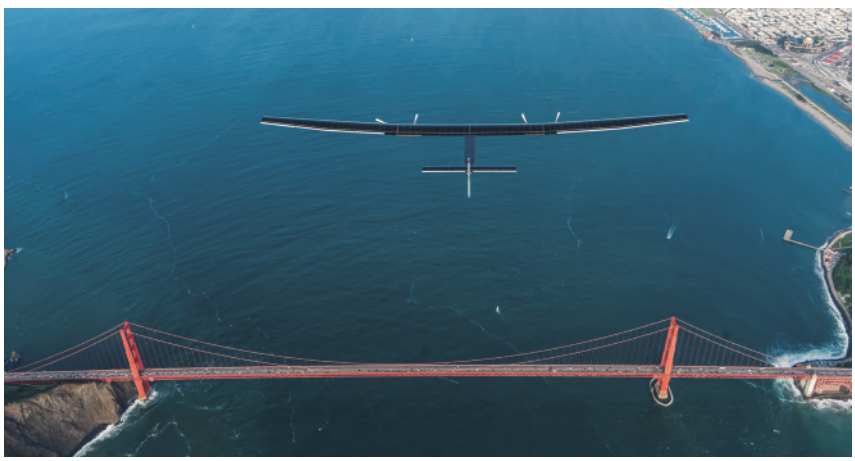
Bertrand Piccard is the founder of the Solar Impulse Foundation. In 2016, he completed the first ever circumnavigation of the globe in a solar-powered airplane. He is now developing collaborations with political and economic decision-makers to give them practical solutions for achieving clean economic growth. His goal is to select 1000 solutions that can protect the environment in a profitable way and present them to decision-makers to fast-track their implementation.

1. To what extent does the COVID-19 crisis offer us a chance to build a circular, sustainable, and highly competitive economy?

Of course, these times are challenging as we are facing a major economic crisis, the amplitude of which is still unclear. But there are also immense opportunities coming out of this crisis. The COVID-19 pandemic has revealed many weaknesses of our world: a fragile and inefficient economy, creating inequalities and a huge amount of pollution.

This means there are thousands of opportunities for entrepreneurs to build new business models, new ways of producing and consuming, new systems, technologies, and processes. All of which must combine financial viability and protection of the environment.

Because of COVID-19, we take less for granted. Life on autopilot has been disrupted, and the whispers are growing about a new path forward – letting go of



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- For me the argument for energy efficiency is logical even more than ecological. It's the fact that we're going to create even more jobs and make a lot of profit to implement the technologies that are going to help us to save energy, food, and natural resources.

the old ways of thinking. **If ever there's a right time to create a circular, sustainable, and highly competitive economy, it is now.** In fact, if we don't act now, we probably never will, and if we don't embrace sustainability as an economic path, we won't last on this planet because we will run out of resources. It's that simple.

2. As the President of Solar Impulse, you flew around the world in a solar-powered aircraft. Were there useful insights for the aeronautics sector and how it can better capitalize on energy efficiency?

Of course, Solar Impulse, by achieving the first ever round-the-world solar flight, was a source of inspiration for the aeronautics sector at an innovation level. The light weight of the carbon fibers we used, the energy density of our batteries, the energy efficiency of our solar cells, and the efficiency of our engine…All of these were phenomenal.

But I think, more than the technological feat, the most important message of Solar Impulse was to show that nothing is impossible. People laughed at me when I first imagined a solar-powered aircraft. But by getting rid of our certitudes and our old ways of thinking, by pushing the boundaries and the limits, we made it a reality. And that's something crucial for an industry that is constantly criticized. So if today, some people say that the aeronautic industry will never manage to be clean and sustainable or recover from this crisis, I think they're completely wrong.

At the Solar Impulse Foundation we're identifying different tracks on the path to energy efficiency for the aeronautic sector. Not only with new technologies, but also with more modern procedures, on the ground and in the air.

3. Energy efficiency is an essential, clean, and profitable solution for economic recovery. How can we expand upon its potential?

Our world has been until now, a world of waste, wasting between 50 and 75% of the energy and the food we produce, as well as the natural resources we extract. This is why **for me the argument for energy efficiency is logical even more than ecological. It's the fact that we're going to create even more jobs and make a lot of profit to implement the technologies that are going to help us to save energy, food, and natural resources.** The financial argument is therefore the argument we have to put forward each time we speak with politicians and corporate leaders rather than only focusing on the benefits on the environment.

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- Efficiency is not only an important pillar for reliable and optimal electricity production, distribution, and consumption, but also offers better management and increased resources efficiency.

Energy Efficiency Planning: Solution for Growing Problems

Jalel Chabchoub
Chief Investment Officer and Energy Efficiency Expert, African Development Bank

Following the COVID-19 crisis, we need a clear plan to reorganize priorities and ensure better resilience to protect against future hazards, particularly those affecting the production and consumption of energy. Re-thinking current systems is essential to ensure more efficient and effective use of our resources going forward.

In recent decades, support and assistance to African countries on energy efficiency through international institutions has continuously increased. However, according to the latest report of the Regulatory Indicators for Sustainable Energy (RISE), African countries are still at the bottom of the scale. Out of the 44 listed African countries, just 14% scored over 50% on the 12 energy efficiency assessment indicators. This indicates that despite efforts, efficiency is not a priority for governments and that the necessary pillars to have a sustainable energy efficiency market are far from firmly established.

Most African countries still suffer from limited electricity access and generation capacities, load shedding, high technical and commercial losses, high electricity bills, lack of resources, and capacity to invest in efficient equipment. These persisting problems are amplifying over time and have a direct impact on the overall development path and social well-being.

Energy efficiency should be included in planning for all energy-related installations and infrastructure to increase project outputs and outcomes. **Efficiency is not only an important pillar for reliable and optimal electricity production, distribution, and consumption, but also offers better management and increased resources efficiency.** Despite the significant efforts of international and development organizations, energy efficiency is still in a precarious stage in Africa. The absence of a governmental global action plan considering the overall impact on countries' different sectors has prevented these efforts from converging to tangible results. It is the government's responsibility to put in place the main energy efficiency market pillars; then through general mobilization of stakeholders the development and implementation of efficiency programs can be achieved.

Government buy-in and ownership are sine qua non for developing an energy efficiency market and leading by example is the main seed for market establishment. This can be attained through the establishment of a National

I. Energy Efficiency: A Key Economic Recovery Strategy

- A National Energy Efficiency Action Plan (NEEAP) is the triangular stone for governments to establish a clear vision adopted and approved by all government stakeholders.

Energy Efficiency Action Plan (NEEAP) that defines government strategy, specific actions, and programs to be untaken with targeted performance objectives for different sectors. NEEAPs should cover technological, economic, social, and environmental dimensions; consider best practices and innovation; prioritize stakeholder management; and identify financial and technical resources and needs.

A NEEAP is the triangular stone for governments to establish a clear vision adopted and approved by all government stakeholders. However, to ignite implementation, governments should lead by example to lay the first brick in market building. This could be demonstrated by establishing a dedicated structure to develop and implement projects for government facilities. This structure, acting on the behalf of government institutions, would identify energy efficiency projects and ensure viability through private Energy Service Companies (ESCOs) under an Energy Performance Contract (EPC) approach. Under an EPC, the performance of projects is continuously monitored while ensuring that the achieved savings will pay for the investments during a defined contractual period. The structure commonly known as a Super ESCO additionally provides necessary technical assistance for the development of private ESCOs, offers project financing, and establishes required tools and procedures for the development of an energy efficiency market.

The African Development Bank (AfDB) has already investigated with certain regional member countries the opportunity to support the development of Super ESCOs, particularly in Morocco, Kenya, and potentially in Senegal with the support of the Sustainable Energy Fund for Africa (SEFA). With the AfDB's assistance, the first Super ESCO in Africa is under implementation. Structures like these will change the landscape of energy efficiency in Africa going forward.

I. Energy Efficiency: A Key Economic Recovery Strategy

Exploring Innovations in Energy Efficiency and Hydrogen as a Clean Energy Carrier

Badr Ikken
CEO of IRESEN

Interview has been lightly edited for clarity and length.

IRESEN is a research institute specialized in clean energies and the environment. How does scientific research engage the public and private sectors and affect change regarding consumption and supply habits? And what are the main obstacles for research?

Morocco is resolutely committed to an energy transition strategy based on a participatory approach and a commitment from the public and private sectors. Whether it was technologies, products, or services, scientific research is at the rendezvous. For example, the gradual replacement of state gasoline and diesel vehicles by electric vehicles is based on several technological innovations. The electric car cannot evolve without synergy and the development of its infrastructure. This is why IRESEN launched an R&D project to develop an innovative charging infrastructure, connected and adapted to the electricity network.

Turning research activities into economically viable applications is not always easy. The R&D efforts deployed at the national level remain uncorrelated by national economic activity. The economy still relies on the import of technological solutions and products and does not sufficiently prioritize local development. However, the recent establishment of tax incentive instruments such as the research tax credit and the establishment of a corporate tax credit will help remove the financial obstacle and motivate companies to get even closer to necessary R&D infrastructure.

IRESEN has developed a multitude of innovations in energy efficiency. Which are the most impactful? And when will these innovations be commercially available?

Energy efficiency in buildings is both a major issue we are facing but also a primary objective that cannot be achieved without the strong involvement of professional and R&D stakeholders who must work hand in hand to bring new solutions and services on the Moroccan and African market.

This is the reason why we are proud to have co-organized the «SOLAR DECATHLON AFRICA» in 2019, the largest student green building competition in the world. It brought together more than 1,000 students dedicated to energy efficiency from 20 different countries to build high energy performance houses exclusively with local materials. Thanks to their knowledge and know-how, these students gained support from several manufacturers who were able to help them innovate across the entire building value

I. Energy Efficiency: A Key Economic Recovery Strategy

- Energy efficiency in buildings is both a major issue we are facing but also a primary objective that cannot be achieved without the strong involvement of professional and R&D stakeholders who must work hand in hand to bring new solutions and services on the Moroccan and African market.
- Energy efficiency is a transversal tool, even a state of mind, which must be observed in all stages of projects, in particular those related to sustainable development, from their design and study phases to the implementation.

chain: from the valuation of new materials to the application of artificial intelligence for the management of the building. As a result, 18 small houses were built, and are still on the solar campus of IRESEN's new research platform, «GREEN & SMART BUILDING PARK,» to serve as living labs for further research.

Although energy savings are on a case-by-case basis, we were able to reach a 60% savings average rate for each house.

For the coming few months and years, we will promote several technological developments such as the use of hemp sheets for thermal and sound insulation, solar thermal air conditioning, compressed and sun-dried bricks and tiles, the storage of photovoltaic electricity in second-life batteries to ensure energy in the evening, the use of phosphogypsum as a construction material, and the use of micro-algae for the treatment of gray water.

IRESEN will soon be launching the «World Power-to-X Summit,» a major event which mainly deals with the potential of hydrogen as a clean energy carrier. What role does it have for energy efficiency?

Morocco has always stood out for its proactive and ambitious strategies for climate protection, and today, thanks to a strong Royal vision and achievements in the clean energy sector, we can engage in the development of this new sector with high added value.

Energy efficiency is a transversal tool, even a state of mind, which must be observed in all stages of projects, in particular those related to sustainable development, from their design and study phases to the implementation.

This is true for hydrogen innovation as well. Hydrogen should be oriented as a priority for the decarbonization of applications or sectors that are difficult to «electrify,» namely heavy industry: steel, petrochemicals, chemicals, heavy transport (trucks), maritime and aeronautics, etc. The use of this clean fuel in these sectors will greatly contribute to improved energy efficiency in the manufacturing, transformation, or operation processes.

The «World Power-to-X Summit» will be an opportunity to discuss the progress of regional, national, and international strategies to be implemented, and above all highlight great opportunities in the clean energy sector which will help to decarbonize our country and bring us even closer to a sustainable economy.

18 energy efficient small houses were built after the Solar Decathlon took place in 2019, on the solar campus of IRESEN's new research platform, «Green & Smart Building Park" in Benguerir, Morocco

Green & Smart Building Park - Benguerir, Morocco

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- Done right, energy efficiency can support the more than 435,000 existing jobs in the field and create new ones in communities across the country – all while reducing greenhouse gas emissions, saving Canadians money, and increasing competitiveness.

How Energy Efficiency is Transforming the Market and Workforce in Canada

The Honorable Seamus O'Regan
Minister of Natural Resources, Canada

Canada has a unique opportunity to think boldly and act bravely to create a stronger, more equitable, and more sustainable society.

This is the Government of Canada's vision for a post-Pandemic economic recovery. An ambitious recovery plan for all Canadians, that leaves no one behind and delivers on our pledge of net zero emissions by 2050.

Enhancing energy efficiency will be centre-stage in that plan.

Not just because it will get us one-third of the way to our international commitments on climate change, but because it is an effective way to create good, green jobs while reducing power bills for families and small businesses at a time when they need it most.

The appeal is clear. **Done right, energy efficiency can support the more than 435,000 existing jobs in the field and create new ones in communities across the country – all while reducing greenhouse gas emissions, saving Canadians money, and increasing competitiveness.**

We are exploring ways to create jobs for construction workers, architects, window manufacturers, and insulation installers. These are women and men, living in rural, urban, remote and Indigenous communities. These are the people who can get our economies moving. To move us forward on this goal, this summer I announced that Canada is joining 15 like-minded countries and supporting organizations which make up the Three Percent Club. This Club is committed to working for a three per cent improvement in global energy efficiency every year.

To support this global goal, we are expanding existing programs and developing new ones to harness the full potential of energy efficiency. Last year, we announced an additional one billion dollars in funding to increase energy efficiency in residential, commercial, and multi-unit buildings.

The Federation of Canadian Municipalities is delivering this through three initiatives in the Green Municipal Fund: collaboration on community climate action; community eco-efficiency acceleration; and sustainable affordable housing innovation.

During the COVID-19 crisis, our government has supported Canadians and our industries. We have provided wage subsidies and financial assistance programs, including to companies in the energy efficiency sector.

Most recently, we announced over $200,000 for e-training opportunities for Canadians, which will prepare them for jobs

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in this growing field. Investment in training is particularly timely and critical because, as a report by ECO Canada confirmed last year, seven in 10 employers reported that a lack of qualified workers was one of the major barriers for growth.

We are also working with experienced partners. Efficiency Canada is creating a training hub that will help Canadians better understand work in the energy efficiency sector. The Heating, Refrigeration and Air Conditioning Institute of Canada and the Canadian Institute for Energy Training will also receive funding to provide virtual training to Canadians at a discounted rate during the pandemic. We are making sure Canadians have the skills they need to lead our clean energy future.

We will continue to advance energy efficiency through potential measures such as:

- Free energy audits;
- Financial assistance for retrofits;
- New measures to increase the market for Energy Star certified products; and
- New ways to get the private sector playing a bigger role in retrofitting large buildings, such as office towers.

This focus on the building sector is intentional because this sector accounts for 17 per cent of Canada's GHG emissions. In fact, according to the International Energy Agency's 2018 Energy Efficiency Potential in Canada to 2050 report, the building sector has the most potential to deliver reductions in energy demand. **Industry partners and regulators are echoing this message: a massive retrofit of Canada's building stock will reduce emissions, promote economic development, and create skilled jobs.**

We are working closely with the provinces and territories to decarbonise buildings. Build Smart: Canada's Building Strategy was endorsed by all territorial, provincial, and federal leaders in 2017. It outlines key pathways, including net zero energy building codes for new builds by 2030, an energy code for existing buildings, continuing to raise appliance and equipment standards, and expanding efforts to retrofit existing buildings.

We are taking concrete action on energy efficiency. It is good for the climate. It is good for our pocketbooks. And it is a source of good jobs that will transform markets and workforces, at home and abroad.

- Industry partners and regulators are echoing this message: a massive retrofit of Canada's building stock will reduce emissions, promote economic development, and create skilled jobs

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- In March 2020, AMEE's missions have been extended to include the development of sustainable mobility and clean industrial production in the country, beside its historic missions in energy efficiency in industry, transport, building, agriculture and cities.The Agency is now under the supervision of the Ministry of Industry, Trade, Green and Digital Economy.

Morocco : The Transformation of AMEE for a Green Recovery

Saïd Mouline,
CEO of AMEE, Moroccan Energy Efficiency Agency

1- Which aspect is the most important for economic recovery:

cheaper energy, cleaner energy, or encouragingenergy users to save energy? How do you convince these actors that the goals they seek can be achieved while consuming less energy? In his last speech on July 29, 2020, King Mohammed VI presented the main titles of a roadmap for a quick economic recovery through a dedicated fund. This plan integrates all the aid and support measures for a gradualreboot of various sectors strongly affected by the covid-19 crisis in order to restore job creation and confidence.

Since 2016, AMEE - the Moroccan Agency for Energy Efficiency - has been the public agency in charge of implementing the government's energy efficiency policy to reduce the country's energy dependence, under the supervision of the Ministry of Energy, Mines and Environment. **In March 2020, AMEE's missions have been extended to include the development of sustainable mobility and clean industrial production in the country, beside its historic missions in energy efficiency in industry, transport, building, agriculture and cities.The Agency is now under the supervision of the Ministry of Industry, Trade, Green and Digital Economy.** The agency's actions will follow differentthose axes.

Decarbonized industry:
Moroccan exporting industry will have to adapt to the upcoming mechanisms at the borders that will beput in place by many countries, through massive implementation of energy efficiency and renewable energy.AMEE will support this programtechnically and financially.

Decarbonized energy:

The government exemplarity program aims to reduce energy consumption and energy bill for public buildings. AMEE is supporting this program by performing the energy audits and implementing the recommended solutions – solar photovoltaic, efficient lighting and air conditioning, among other measures.

Entrepreneurship & Capacity building:

AMEE will support entrepreneurship in the green economy area through different measures.

- Fiscal provisions will be deployed in many forms. Fiscal incentives will also target green industrial companies and Energy Service Companies (ESCOs).
- Teleworking will be also promoted in order to reduce commuting.
- Large training programs will be deployed for green jobs in buildings, industry and agriculture, including through

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- This is why, in my opinion, our best response to the health crisis is to change the way we plan and program the economic recovery by fostering a green and sustainable economy, while promoting local production and reducing dependence on an unstable international market that consumes foreign currency.

e-learning.
- Moroccan green label will be created for local industries.

AMEE has strengthened its tools and programs intended for these sectors to encourage investment in energy saving measures but also in the green sectors of the future, to strengthen the weakeraspects of our productive apparatus by taking into account energy as a factor of competitiveness. With strategic measures, we can save more than 20% of ourenergy bill, optimize the use of raw materials, reduce waste, and accelerate toward the energy transition and carbon-free production.

2. What does the Ecostart project led by AMEE, ANPME and GIZ consist of and how does it integrate energy efficiency?

In the current context, it isnecessary to recall that in addition to the very difficult health situation affecting our planet, an economic crisis - unprecedented since the great depression - is looming before us. To address this, we will have to bring real sustainable responses by defining recovery strategies focused on the green economy.

In terms of employment, according to the International Labor Organization, the COVID-19 pandemic threatens around 25 million jobs worldwide. In our country the impact will also be very significant: all sectors have been impacted, and manypeople have lost or will lose their jobs. We must help and support them through initiatives like Ecostart and its call for projects. Our agency AMEE, with ANPME (the Moroccan SME Promotion Agency) and GiZ (the German cooperation), is interested insupportingthe selected projects on capacity building, technical and financial support for the proposed green solutions.
It is also important to note that support from AMEE will not be limited to the Ecostart initiative. Indeed, AMEE will continue to support the winners beyond this initiative by providing them with technical support for the implementation of their projects. In addition, they will benefit from high visibility through the AMEE website, our social networks,and our media partners specializing in the green economy.

3. What ecological solutions can help respond to the health crisis?

The current health crisis has certainly had some positive impacts on the environment through the slowdown in mobility, social distancing, and the decline in activity – although these benefits are transitory since carbon emissions and other pollutants will return to their former levels as soon as the epidemic subsides. On the other hand, the massive use of protective masks and hydroalcoholic gels is creating a huge trail of medical waste in the environment.

This is why, in my opinion, our best response to the health crisis is to change the way we plan and program the economic recovery by fostering a green and sustainable economy, while promoting local production and reducing dependence on an unstable international market that consumes foreign currency. Even with a low price of fossil fuel, we should not make a mistake by investing in the old and dirty economybut really accelerating the transition to the green one.

About AMEE
AMEE is the only strategic public agency Created in 2016, whose mission is to implement government policy on energy efficiency.

It is the result of the transformation, in 2016 of the National Agency for the Development of Renewable Energies and Energy Efficiency ADEREE, which was transformed in 2009, of the Center for the Development of Renewable Energies CDER, created in 1982.

In March 2020, AMEE came under the supervision of the Ministry of Industry, Trade, Green and Digital Economy. Today there is a new framework for the green economy with dedicated agency. AMEE will now encompass green economy by keeping its energy efficiency missions, but above all with new missions related to clean production in industry and sustainable mobility.

AMEE has a technological platform at its Marrakech site which houses a Green platform training center specialized in energy efficiency in several sectors, such as industry, construction, transport, agriculture and lighting.

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- One way to get business moving again is to boost demand for energy-efficient products and services.

U.S. Federal Policy Approaches to Renewing the Energy Efficiency Sector

Lisa Jacobson
President, Business Council for Sustainable Energy (BCSE), United States

There are 360,000 reasons to get the American energy efficiency economy back to work, fast. That's one for every job lost in the efficiency sector since the start of the COVID-19 pandemic – jobs that can be recovered if companies are able to weather the current economic slowdown and rehire these hundreds of thousands of skilled workers. A big risk for the sector is that local employers may not have the bridge capital to remain in business until the economic situation allows for putting people back to work. Policy can provide relief and that relief is needed now.

The federal government's Paycheck Protection Program, now closed to applications, and other short-term relief measures have been invaluable to small businesses as they absorbed the initial shock of the pandemic. However, more than seven months into the crisis, the ability of these businesses to return to work varies across the country and more assistance is needed. **One way to get business moving again is to boost demand for energy-efficient products and services.**

Organizations like the Business Council for Sustainable Energy, the Alliance to Save Energy, and other trade associations for the industry are working to inform the U.S. Congress on how many jobs are at risk and the measures legislators can take to protect and expand the positive effects of energy efficiency work. Many of these steps include incentivizing demand for energy efficiency and leveraging federal funding to unlock private investment.

Policies that the BCSE and other advocates support include:

- Leveraging federal grant funding with private sector capital for upgrades to schools, hospitals, military bases, and other mission-critical buildings.
- Setting standards for federal building new construction and renovation aimed at meeting high efficiency or even net-zero energy goals.
- Expanding and extending incentives for efficiency investments through the tax code, such as the 25C tax credit for homeowner energy efficiency improvements and the 179D energy-efficient commercial building tax deduction.

In addition, Congress is considering the American Energy Innovation Act (AEIA), a bipartisan piece of legislation that

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- Federal policymakers can significantly reduce the long-term uncertainty facing the American energy efficiency industry and its workforce by adopting policy support now. For the benefit of both local economies and global efforts to combat climate change, America cannot afford to let the energy efficiency sector make a gradual recovery.

would be a great step forward in modernizing American energy policy and setting the energy efficiency industry on a stable growth trajectory.

The AEIA includes a suite of energy efficiency measures, such as the creation of grants for energy efficiency improvements for schools and nonprofits, workforce training programs, and materials research and manufacturing investments. It would also authorize a Federal Energy Management Program and expand federal performance contracting programs (where the contractor is compensated based on demonstrated cost savings from efficiency improvements). The package also reauthorizes and expands the U.S. Department of Energy Weatherization Assistance Program.

Federal policymakers can significantly reduce the long-term uncertainty facing the American energy efficiency industry and its workforce by adopting policy support now. For the benefit of both local economies and global efforts to combat climate change, America cannot afford to let the energy efficiency sector make a gradual recovery. With a strong policy response, the American energy efficiency sector will return in full force, supporting millions of American families and creating a more efficient and resilient built environment.

II. Policy Approaches to Stimulating Investment

When Citizens Make Policy: France's Climate Citizen Convention, Energy Efficiency, and the Importance of Education

Benoit Lebot
Former Executive Director of the International Partnership for Energy Efficiency Cooperation (IPEEC)
Jurei Yada
Coordination Lead, Bern Network on Financing Data for Development, PARIS21 Secretariat

In October 2019, a group of 150 French citizens from all backgrounds and age groups were brought together by the French Government to form the Climate Citizen Convention (CCC). Their task? Nothing less than developing France's future policies for climate action. These were ordinary citizens, selected completely at random, with no formal training in climate issues or public policy. Yet in the space of six months, they produced a set of recommendations for the French President that surprised many experts in their ambition and vision for how France could reduce its greenhouse gas (GHG) emissions in line with its commitments under the Paris Agreement. How did they achieve this – and what does their success tell us about citizen participation in policymaking, climate ambition, and even accelerating energy efficiency?

The Process

The members of the CCC began their journey with only a basic understanding of the main issues relating to climate change. To conduct their work, they first embarked on a series of informatory interviews with a range of experts from different fields: physicists, climate change specialists, policymakers, economists, and civil society representatives. Then over ten working weekends, the group met to pen a series of 150 proposals for the French Government, putting forth a range of financial, technical, and behavioral measures for local and national implementation. These proposals were presented to the French President, Emmanuel Macron, and his cabinet in June 2020 and included the following recommendations, among others:

- To amend the national constitution to introduce strict environmental protection clauses for future French legislation.
- To lower energy demand through greater energy efficiency in the built environment, transportation, and industry including by introducing mandatory provisions for deep renovation of existing building stock,

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- The Climate Citizen Convention (CCC) shows us the critical importance of educating citizens as the basis for participatory, fact-driven policymaking.
- Knowledge is at the heart of climate action, and is in particular at the heart of the energy transition we face.

banning coal and oil furnaces for space heating, reducing the highway speed limit from 130km/h to 110km/h, and mainstreaming carbon disclosures in industry.
- To ban commercials and advertisement campaigns for products and lifestyles incompatible with a low carbon society.
- To encourage and prioritize investments into renewable energy.

The CCC's work concluded with the French Government's decision to adopt 146 of the 150 proposals, which will now go through France's legislative process to become law.

The Lessons

The CCC shows us the critical importance of educating citizens as the basis for participatory, fact-driven policymaking. For example, members of the group may not have started out with any notion of energy efficiency, but through successful citizen engagement and knowledge-sharing with experts, they ended up proposing it as one of the solutions for France to attain its target of reducing GHG emissions by 40% by 2030. This casts doubt on some inherent assumptions, such as that ordinary citizens care more for convenience and continuing their normal lives than engaging with technically complex questions – let alone endorsing potentially disruptive policy changes to protect the planet. For the energy efficiency community, there is a lesson here for how we could communicate, advocate, and raise the visibility of energy efficiency beyond our field. There is also hope that certain biases can be overcome through processes like the CCC – not one citizen who was selected chose to leave the group before the work was done, regardless of what their personal views may have been on the climate crisis.

Knowledge is at the heart of climate action, and is in particular at the heart of the energy transition we face. The question is how we can promote open exchanges and knowledge-sharing approaches that reach those who may not otherwise have chosen to care, learn more, or affect change.

The views and opinions expressed in this article belong solely to the authors and do not represent those of the institutions where the authors are employed.

II. Policy Approaches to Stimulating Investment

- Energy efficiency is one of the most cost-effective sectors stimulus packages can focus on to support climate-compatible recovery and job creation in a post-COVID-19 world.

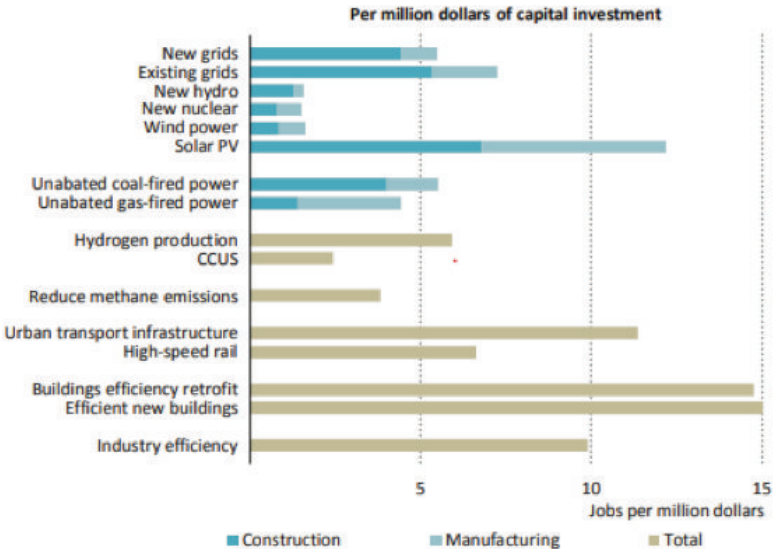
It's Time for a Global Refresh to Revitalize Financing for Energy Efficiency Investments

Filippo Berardi
Senior Climate Change Specialist and Climate Change Coordinator, Global Environment Facility (GEF)
David Rodgers
Former GEF Climate Change Coordinator

Is there a missing ingredient that is restricting financing for energy efficiency investments? We know that most efficiency projects have positive net present value and relatively short payback periods, and yet we are not seeing the volume of investment that we would expect to see. In fact, recent data by the International Energy Agency (IEA) shows that the rate at which technologies and processes are becoming more energy-efficient is slowing. At the Global Environment Facility (GEF), early support helped many developing countries pioneer successful policies that resulted in billions of dollars in energy-efficient investments. To stimulate further investments, we believe it is time to launch a global refresh of policies that promote energy efficiency.

This is particularly important considering two elements: first, energy efficiency alone could deliver more than 40% of the emission reductions needed to meet the objectives of the Paris Agreement. And second, **energy efficiency is one of the most cost-effective sectors stimulus packages can focus on to support climate-compatible recovery and job creation in a post-COVID-19 world.**

Figure 1. Construction and manufacturing jobs created per million dollars of capital investment and spending by measure



Source: International Energy Agency. Sustainable Recovery - World Energy Outlook Special Report

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- The challenges of the post COVID-19 world and the stall in global efficiency investments call for a massive global refresh in energy efficiency policy – energy efficiency 2.0.

Since its inception in 1991, the GEF has invested more than $1.3 billion in support of more than 240 energy efficiency projects in developing countries, leveraging $14 billion in co-financing. From the early days, GEF projects promoted enabling environments that de-risk private sector investments, testing innovative business models and creating capacity in government agencies and financial institutions.

To remove barriers and incentivize efficiency, GEF resources helped clear a path for stronger building codes, energy efficiency labelling, and innovative investment vehicles while looking to establish ecosystems of technical intermediaries such as energy services companies. Countries such as India and China, and many others across Asia, Africa, and Latin America, used GEF funding to establish the foundational polices to legislate, regulate, and finance energy efficiency investments.

More recently, building on a successful partnership with Sustainable Energy for All, the GEF invested in a family of energy efficiency accelerators. Each accelerator covers a specific sub-sector – such as vehicle efficiency standards, appliances, buildings, lighting, industry, and urban district energy – and brings together public and private sector actors to "accelerate" actions and commitments at national and sub-national levels toward more stringent energy efficiency policies and targets.

These experiences illustrate a common-sense understanding within the GEF community that well-designed policies drive financing for energy efficiency investments. Despite this understanding, we see lower than expected demand for GEF support for policy interventions. One obvious explanation is that the nature of the GEF is to innovate and catalyze: once foundational policies are established, national governments are encouraged to provide sufficient funding for implementation, enforcement, updates, training, and communication, as well as to continue to fund incentive mechanisms.

To counterbalance these trends and unlock energy efficiency's full potential to contribute to both climate mitigation and post-pandemic economic recovery, we propose a three-tiered approach:

1. We must initiate a global policy refresh for energy efficiency. The call for renewed and enhanced regulatory frameworks should incorporate policies that create self-reinforcing and evolving ratchets; standards that are updated on a regular basis; targets that are re-evaluated periodically; and funding streams for enforcement that are locked in through tailored funding mechanisms. To this end, initiatives such as the Three Percent Club are instrumental to promoting policy ambition while matching country needs with provision of support.
2. International development agencies and financial institutions, including the GEF, must work together to spearhead the development of a new generation of efficiency policy interventions. These interventions must address changing country needs and help governments enact the plans presented in their NDCs, while enhancing their ability to follow a sustainable green recovery path after COVID-19.
3. We must provide credible investment roadmaps so that donors can mobilize resources for energy efficiency initiatives along with other critical global needs. We can do this by building on the momentum created by the efficiency-related initiatives presented at the 2019 Climate Action Summit, and by leveraging the UK COP Presidency's intention of making efficiency one of the key themes for COP26.

The challenges of the post COVID-19 world and the stall in global efficiency investments call for a massive global refresh in energy efficiency policy – energy efficiency 2.0. We believe the approach outlined above will help national and local governments gain the support they need to launch and sustain this effort, which in turn will drive financing for energy efficiency investments at the project and product level. At the GEF, we will continue to place energy efficiency at the heart of our policy support for countries going forward, as we are convinced that efficiency improvements play a pivotal role in maximizing returns for the economy and the global environment.

III. Sector-Based Approaches

Accelerating Recovery through Energy Efficiency: The Industrial Energy Accelerator

Rana Ghoneim
Chief, Energy Systems and Infrastructure Division, United Nations Industrial Development Organization

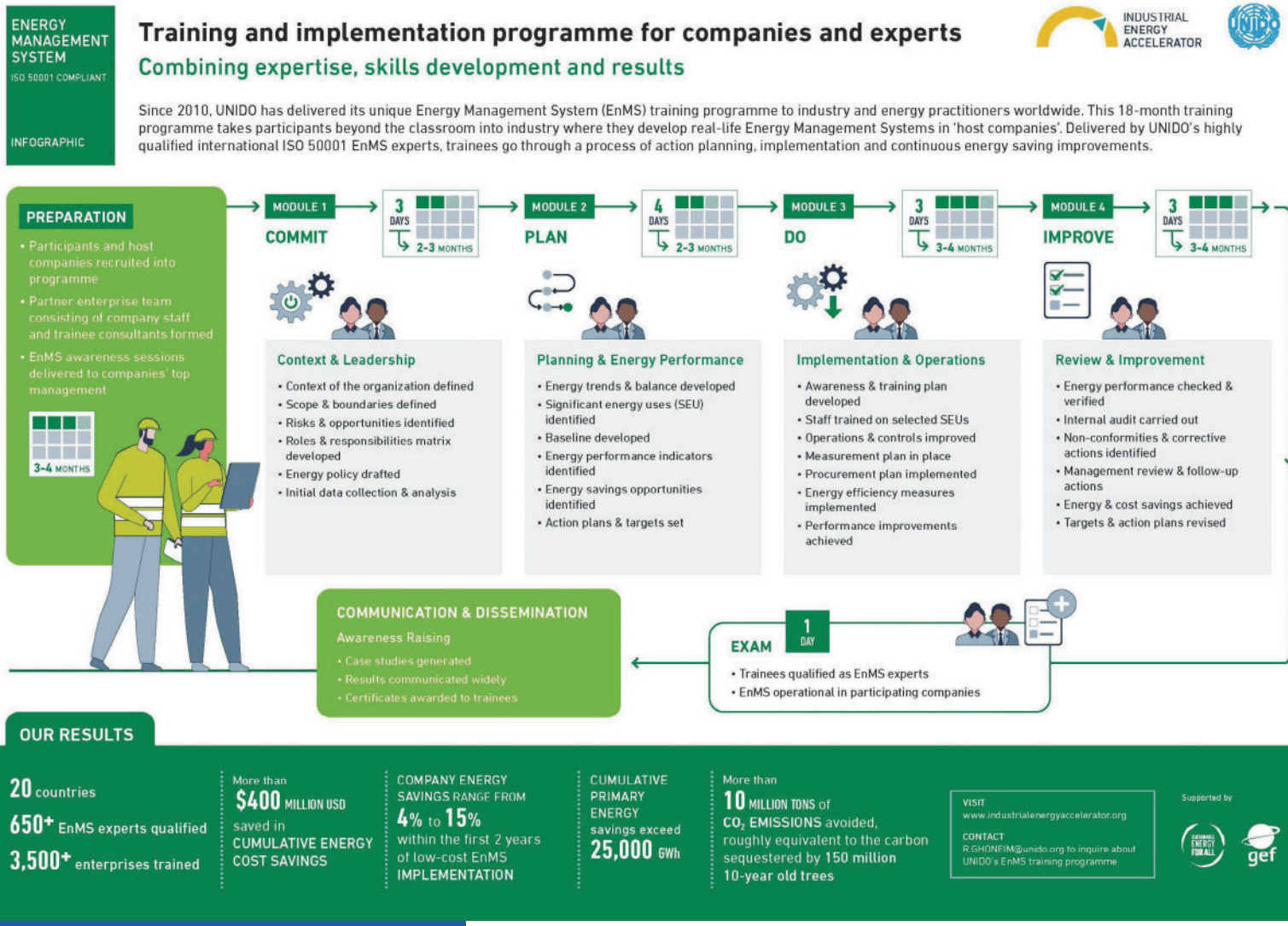
When the COVID-19 crisis hit, bringing economies and industries to a standstill, there were just 10 years left to meet the United Nation's 2030 Agenda for Sustainable Development. With production stopped or slowed for many companies and demand reduced for certain products, industry remains one of the sectors most affected. As the economic engine slowly restarts, companies, especially small and medium-sized enterprises (SMEs), are looking into ways to recover and cut costs as they try to stay afloat. There is a risk that this could lead to more job losses and a peak in energy consumption and related emissions if sustainability goals are sacrificed in the name of cost savings. Rather, **now is an opportune time to invest in energy efficiency as the cheapest and most effective way to rapidly generate new jobs, reduce energy bills, and curb emissions.**

Energy Efficiency is Critical for SME Survival During the Build Back Better Phase

The United Nations Industrial Development Organization (UNIDO) provides industrial energy efficiency programs around the world. Many business participants have reduced their energy bills by up to 15% with simple low- and no-cost measures. This is in addition to the operational efficiency gains made with the implementation of energy management systems and by improving the quality of data on project performance. These efforts also increase the bankability of projects: The energy savings resulting from innovative efficiency measures will free capital for SMEs to re-invigorate their cash flows during economic recovery.

UNIDO has worked with more than 3,500 enterprises in 20 countries over the past 10 years and has contributed to energy cost savings of more than USD $400 million. There is enormous potential to expand upon these savings if energy efficiency is more widely adopted across more industries and countries.

- Now is an opportune time to invest in energy efficiency as the cheapest and most effective way to rapidly generate new jobs, reduce energy bills, and curb emissions.



• The effect of the pandemic doubles the urgency for action if we are to achieve the sustainable development goals and drive a sustainable and resilient recovery.

Even so, SMEs often don't have the technical capacity to identify and implement the most beneficial projects nor the financial capacity to fund more costly measures. This is why in 2020, UNIDO re-directed its efforts, drawing on its experience to produce a series of knowledge kits about industrial energy efficiency designed to equip industry practitioners to take the first steps toward improving efficiency. We have just launched the first of five energy efficiency solutions toolkits on Energy Management Systems, including practical answers to common questions and a growing list of UNIDO experts with a wealth of experience in working with industry. By the end of 2020, the Efficiency Solutions series will include toolkits on motor-driven systems, industrial heat, industrial cooling, and energy metrics and performance indicators.

The effect of the pandemic doubles the urgency for action if we are to achieve the sustainable development goals and drive a sustainable and resilient recovery. Given industry's huge consumption of global energy resources, our challenge now is to scale-up and expand what we started 10 years ago. Working together and making practical knowledge accessible is a powerful way to help now. Help us share this knowledge today.

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- If we're to achieve the Paris Agreement target of limiting global temperature rise to 1.5°C, then all countries, industries, and organizations must urgently work toward zero greenhouse gas emissions. To do this, we cannot ignore the cooling sector.
- Getting to zero emissions for cooling will require a multipronged approach that transforms how cooling is generated and used. This approach consists of four key steps: reduce, shift, improve, and protect.

Energy Transition: Stay Cool and Get to Zero

Dan Hamza-Goodacre
Non-Executive Director, Kigali Cooling Efficiency Program (K-CEP)

It's hard to ignore the fact that the world is getting warmer. The last five-year period has been the warmest five years on record, so **if we're to achieve the Paris Agreement target of limiting global temperature rise to 1.5°C, then all countries, industries, and organizations must urgently work toward zero greenhouse gas emissions. To do this, we cannot ignore the cooling sector.**

Refrigeration and air conditioning (AC) are estimated to be responsible for around 7-10% of global CO_2 emissions – three times more than aviation and shipping combined – yet are often overlooked. This blindspot is a double-edged sword: Not only does mechanized cooling use super-polluting F-gases, which can be up to 12,000 times more harmful than CO_2, it also consumes huge – and often inefficient – amounts of energy. In India, for example, we expect there to be an additional 112 million AC units by 2030, which would consume 150 gigawatts of energy, the equivalent of 300 new power plants.

Despite these problems, global access to cooling is vital for human health and prosperity, particularly in a warming world. Cooling helps to keep food fresh all along the 'cold chains' that supply our nutritional needs, keeps temperature-sensitive vaccines and medicines viable, and maintains human comfort in buildings.

Getting to zero emissions for cooling will require a multipronged approach that transforms how cooling is generated and used. This approach consists of four key steps: reduce, shift, improve, and protect.

Firstly, to reduce cooling emissions we need to **reduce the need for mechanized cooling**. By adopting a combination of **passive cooling techniques and nature-based solutions**, buildings and cities will become cooler, reducing the need for air conditioning and thus emissions. Sustainable design techniques like reflective materials and green spaces are proven to reduce internal and external temperatures, but require better policies, building codes, and financial incentives. Reducing cooling emissions will also require **changes in behavior**, including not 'overcooling' buildings and adjusting activity levels during the hottest parts of the day.

Secondly, we need to **shift away from polluting forms of cooling and toward technologies that emit fewer GHGs**, both in terms of direct (refrigerants) and indirect (energy) emissions. In regard to refrigerants, cutting the production and consumption of hydrofluorocarbons (HFCs) in cooling has the potential to avoid up to 0.5°C of global warming by the end of the century. We also need to adopt better practices when it comes to

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equipment disposal; around 90% of refrigerant emissions occur when refrigerators and ACs are disposed of due to dumping or damage.

To cut indirect emissions, we must focus on **transitioning to low- or zero-carbon energy** sources. If global cooling use increases to the expected 5.6 billion AC units by 2050, that alone will require the combined current electricity capacity of the US, EU, and Japan. While renewable energy is crucial to reducing GHG emissions while meeting this growth, it's unfortunately not that simple. Not all renewable sources are compatible with the nuances of cooling, such as meeting night demand or sustaining the constant temperatures needed for refrigeration.

For these reasons, innovation in energy storage, including thermal energy storage, will be critical. District cooling and evaporative cooling can also be greatly scaled up.

Thirdly, we must urgently **improve the efficiency of cooling appliances**, which, if done correctly, could save nearly $3 trillion in energy costs by 2050. Improvements in cooling efficiency are expected to double the climate benefits of phasing out HFCs, leading to 1°C of warming avoided by the end of the century. Increased efficiency can be a rapid solution, but we must move beyond incremental improvements in technology and commit to making significant changes.

The final piece of the puzzle is to ensure that we **protect those who are most vulnerable to a lack of access to cooling**. Cooling is not a luxury, and global access is vital for the realization of several UN Sustainable Development Goals. We cannot simply limit cooling's climate impact by limiting global access.

Developing a pathway to zero emissions for cooling is complicated but necessary. By adopting better building design and urban planning, moving away from polluting refrigerants and energy sources, and increasing the energy efficiency of cooling technology, we could drastically reduce the negative impacts of the cooling sector. No single component will get us to zero.

As you read this, a consortium of the Kigali Cooling Efficiency Program (K-CEP), the Carbon Trust, the UN Cool Coalition, and Oxford University is developing a pathway to zero for the cooling sector, as part of the COP26 Champions and Marrakesh Partnership 'Climate Action Pathways' campaign. More information will be released later this year. In the meantime, stay cool (sustainably!).

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- As the world recovers from COVID-19 and takes action to address the accelerating threat of climate change, it is critical for countries to take steps to shore up infrastructure in a way that responds to both crises – while ensuring reliable energy access for all.

Build Back Better: Cooling the Post-COVID-19 World Efficiently

Karan Mangotra
Associate Director, The Energy and Resources Institute (TERI)
Manjeet Singh
Associate Fellow, TERI

The COVID-19 crisis has highlighted the need for robust infrastructure at all levels. Overarching public health infrastructure must consider not just healthcare facilities, but food and energy security. **As the world recovers from COVID-19 and takes action to address the accelerating threat of climate change, it is critical for countries to take steps to shore up infrastructure in a way that responds to both crises – while ensuring reliable energy access for all.** In almost no sector is this as important as cooling.

For example, amidst the COVID pandemic, issues related to supply-chains – which provide essential items such as food and medicine to populations – have gained prominence, with challenges even more severe in developing countries where the supply chain infrastructure is often not effective and especially fragile along the cold chain. About one-third of all food produced globally for human consumption is either lost or wasted, which severely impacts farmers' incomes, wastes precious resources, and generates greenhouse gases. In India, the government took steps to prevent this waste through its Cooling Action Plan, which emphasizes cold chain infrastructure and its benefits for food security, farmers' income, and healthcare. By upgrading this infrastructure with the latest, energy-efficient technologies, as well as looking at integration of renewables, the benefits of a reliable cold chain can be expanded while minimizing climate impacts.

Countries must also look at a host of options to improve the sustainability of air conditioning as temperatures rise. One approach is through building energy codes, minimum energy performance standards (MEPS), and labeling. The MEPS and labeling program in India have contributed to about 43% of market average efficiency improvement for room air-conditioners over the past 12 years. Additionally, a revised methodology for evaluating air conditioner performance in India has promoted better international market synergies and advancement in adoption of new energy-efficient technologies in the country. A good consumer communication strategy is also critical to increase market penetration of more efficient products.

Another consideration for improving cooling efficiency is overcoming the initial price hump which makes energy-efficient equipment less competitive on the shelf as compared to

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- Economies are at the tipping point for global cooling demand, and any delay in action would bring disastrous consequences for emissions.

conventional (less efficient, higher Global Warming Potential) technologies – although energy savings make these products more cost effective in the long term. The hump can be minimized while maximizing climate benefits by a combination of appropriate financial interventions, such as grants and/or low-cost loans for energy efficiency enhancements, bundled with incremental financing for hydrofluorocarbon (HFC) phasedown.

This can also be mitigated through innovative financial models such as bulk procurement and demand aggregation to drive down prices. Under the Unnat Jyoti by Affordable LED's for All (UJALA) Scheme, using the economy of scale, the Indian government has procured a substantial volume of LED bulbs, with the dual aim of increasing the market size and lowering the cost of energy-efficient LED lighting. Bulk procurement programs are effective mechanisms that allow penetration of next generation technologies.

The role of international, multilateral agreements in achieving climate and sustainable development goals also must be acknowledged. These agreements play a crucial role in nudging national policies to combat climate and also encourage sub-national and non-state actors to act. This was evident at the 2019 UN Climate Summit, where major businesses and industries pledged to reduce emissions. Several Indian industry front-runners were also part of the 'Industry Transition Track' led jointly by the Government of India and Sweden. Multilateral agreements can play a crucial role in building new alliances and coalitions as highlighted by the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure. Agreements must also start thinking beyond short- and medium-term targets, and plan for a long-term strategy that ensures coordination across developmental policy and climate action and considers compounding risks.

Finally, there are two key aspects that countries should consider to address sustainable and accessible cooling in a post-COVID world. First, as in India, countries should prepare national Cooling Action Plans: It is the need of the hour to have an integrated, long-term vision toward cooling encompassing refrigerant transition, reducing demand, energy efficiency, and advancing technology options. Secondly, countries and organizations should join coalitions to catalyze technology development. There is potential to build on existing networks (Clean Energy Ministerial, Industry Transition Leadership Group, Mission Innovation) – especially on cooling.

Enhanced collaboration enables pooling together experiences and expertise to enhance the effectiveness of policy coordination and impact. The TERI-led SHEETAL – Alliance for Sustainable Habitat, Energy Efficiency and Thermal Comfort for All is one such initiative to enhance collaboration with civil society to maximize the impact of research. There is a need for more such collaborations.

Economies are at the tipping point for global cooling demand, and any delay in action would bring disastrous consequences for emissions. Integrated national actions and global collaborative efforts are a path forward for cooling the post-COVID-19 world affordably, efficiently, and sustainably.

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New Moroccan Leadership under the Montreal Protocol with Co-Benefits for COVID-19 Recovery

Mohammed Rida Derder
Special Counsel for MENA and Africa, Institute for Governance and Sustainable Development (IGSD)
Stephen O. Anderson
Director of Research, IGSD

Building on decades of Moroccan leadership regarding the Montreal Protocol on Substances that Deplete the Ozone Layer, collaborators including Agence Marocaine de l'Efficacité Énergétique (AMEE), the Morocco National Ozone Unit, BANK OF AFRICA - BMCE Group, AOB Business Consultant Group, and the Institute for Governance and Sustainable Development (IGSD) will seek funding to immediately replace older room air conditioners (RACs) in government facilities that were inefficient when purchased, poorly installed and badly maintained for lifetime energy efficiency, and are expensive to operate with health impacts from fossil fuels burned for electricity generation.

Morocco has earned a global reputation for extraordinary leadership on ozone and climate protection. The Morocco National Ozone Unit is part of a global network of offices specifically created under the Montreal Protocol to share information, build capacity, and guide investment to phaseout ozone-depleting substances (ODS) that cause skin cancer and cataracts, suppress the human immune system, damage agricultural and natural ecosystems, and deteriorate paints and plastics. In 2009, Morocco, the Federated States of Micronesia, and Mauritius were the first countries to advocate for the Montreal Protocol to control ozone-safe hydrofluorocarbons (HFCs) – which were once necessary to rapidly phaseout ODSs, but are still powerful greenhouse gases (GHGs) no longer needed due to technological advancements commercializing more environmentally-friendly alternatives. This pioneering Morocco Leadership was successful in 2016 when all 197 Parties to the Montreal Protocol agreed to the Kigali Amendment to phase down the production and consumption of HFCs, and also agreed to simultaneously increase energy efficiency during the transition. Morocco chose to phasedown HFCs under the fastest schedule for developing countries, rather than the slower schedule permitted for developing countries with high ambient temperatures.

In response to the Kigali Amendment, AMEE partnered with BANK OF AFRICA - BMCE Group, AOB, IGSD, and others

- Morocco has earned a global reputation for extraordinary leadership on ozone and climate protection.

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in forming the Morocco Bankers Room Air Conditioner Buyers Club to stop the dumping of inefficient ACs with obsolete hydrochlorofluorocarbon (HCFC) 22 and HFC-410A and to aggregate demand for high-efficiency RACs with low-global warming potential (GWP) refrigerants. As part of this partnership, AMEE and IGSD signed a memorandum of understanding to develop a new metric for AC performance that considers the local circumstances of climate and urban heat islands and the time-of-day carbon intensity of electricity. The metric developed by AMEE, IGSD, and other partners was published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

Success in the new project replacing older RACs in government buildings will prove the economic merit of expanding AC replacements in Morocco and replicating the strategy throughout Africa. The model is likely appropriate for the replacement of older refrigeration and AC equipment in applications other than room RACs.

Recovery from the COVID-19-induced recession can also be accelerated by this program through 1) jobs created in marketing, sales, distribution, installation, and service of the new RACs, 2) recovery and destruction in local cement kilns of ozone-depleting and greenhouse gas refrigerants, 3) the recycling of useful AC parts and materials, and 4) increased local commerce, as savings in energy realized by the new super-efficient ACs purchased in bulk are spent locally.

Shifting spending from foreign to local purchases improves balance of trade, strengthens domestic currency, and creates jobs and prosperity as funds circulate in the local economy. Added to that are the community benefits of mass replacement of RACs and their service to maintain energy efficiency over the life of the appliance. This community impact grows over time as savings accumulate on avoided fuel and energy infrastructure and as the income from the new jobs circulates in the local economy.

• Shifting spending from foreign to local purchases improves balance of trade, strengthens domestic currency, and creates jobs and prosperity as funds circulate in the local economy

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How the District Energy Accelerator Can Help Accelerate the Recovery through Energy Efficiency

Benjamin Hickman
Regional Technical Advisor for Asia and Europe, United Nations Environment Programme (UNEP) District Energy in Cities Initiative
Celia Martinez
Technical Coordinator, UNEP District Energy in Cities Initiative

The COVID-19 pandemic poses a major challenge to humankind and has taken an enormous emotional toll. In many of the cities where the District Energy in Cities initiative – coordinated by the United Nations Environment Programme as part of the Sustainable Energy for All EE Accelerator platform– is active, COVID-19 has resulted in the drafting of officials from across municipal departments into emergency response teams. It is important to acknowledge their heroic efforts in combatting and controlling the virus. While this has placed many projects on pause, when the pandemic comes under control, we will be ready to provide the technical support needed to deliver more energy-efficient, resilient, and cost-effective heating and cooling through district energy systems.

But it is unlikely to be business as usual. District energy projects may face challenges due to economic uncertainty in the real estate sector, tighter municipal budgets, and new work patterns rendering some commercial floorspace obsolete. But whether floorspace is heated or cooled at home or at work, the result is the same – heating and cooling accounts for 50% of total energy demand from buildings globally, with this demand predominantly met through fossil fuels.

While there may be difficulties for district energy projects ahead, there are also opportunities. The increased importance of indoor air quality and comfort at home and work could boost demand for higher quality, more efficient, and centralized Heating, Ventilation and Air Conditioning (HVAC) systems. Such systems are the easiest to connect to district energy. Additionally, citizens who witnessed the drop in air pollution experienced during lockdowns may feel compelled to act on maintaining cleaner air by choosing more sustainable options. Finally, tighter budgets in the real estate sector could make some building developers open to district energy to shift expensive heating or cooling systems off their balance sheet.

District energy systems should also be considered a central element of green recovery plans and economic stimulus. **District energy projects create high quality, local jobs and help cities and countries retain wealth by using local resources**

- District energy projects create high quality, local jobs and help cities and countries retain wealth by using local resources and reducing energy bills by up to 50% through energy efficiency.

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and reducing energy bills by up to 50% through energy efficiency. District energy projects provide long, stable returns allowing them to grow from covering a single block to a city-wide network in 10-20 years. Unfortunately, district energy projects aren't as easy as plugging in an air-conditioner or an electric radiator – they require expert planning, forward-looking municipal officials and real estate companies, strong coordination, and upfront development costs. UNEP and our partners bring this tailored support to willing cities, and we have seen a general surge in interest in the countries where we work. This is reflected in city activities but also new national frameworks like India's Cooling Action Plan, which promotes district cooling as crucial for hydrofluorocarbon phasedown, or Chile's Presidential Plan, which prioritizes district heating as a strategy to tackle terrible air pollution in the country's South.

Besides cities and space heating and cooling, UNEP is expanding district energy activities to look at integration with data centres, industrial heating and cooling demand, and the urban cold chain. For example, in India, we are supporting the greenfield Hyderabad PharmaCity – a new pharmaceutical industrial city – to prepare and tender what will be India's largest district heating and cooling system.

With UNEP support, the economic benefits of district energy can be achieved while tackling the climate crisis through reduced primary energy consumption and emissions. In Morocco, a district cooling prefeasibility study performed by the initiative in the city of Marrakech revealed that district cooling would improve cooling efficiency of connected buildings by 47% and reduce cooling-related CO_2 emissions by 46%. In Chile, the study "Heat Roadmap Chile" performed in collaboration with Aalborg University showed that with a market potential of 40%, district heating could contribute to reducing the country's total primary energy consumption by 13% and overall CO_2 emissions by 20%.

District energy systems can provide the jobs, resilience, sustainability, and economic returns demanded by citizens. In a post-COVID world, UNEP and partners will work hard to ensure district energy is a key element of building back better and work with all stakeholders to accelerate the green recovery by facilitating the decarbonization of the heating and cooling sector.

The District Energy in Cities initiative is a public-private partnership coordinated by the United Nations Environment Programme that supports cities and countries in developing and emerging economies to accelerate investments on district energy systems. The Initiative is one of five energy efficiency accelerators of Sustainable Energy for All. For more information on the District Energy in Cities Initiative, please visit: www.districtenergyinitiative.org

• With UNEP support, the economic benefits of district energy can be achieved whiletackling the climate crisis through reduced primary energy consumption and emissions.

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- As governments consider economic stimulus and recovery, this is the time to accelerate policies and investments to transform mobility with a focus on efficient, zero emission, low-carbon vehicles.
- The International Energy Agency estimates that fuel economy policies for passenger transport have saved the equivalent of 2.5 EJ of energy between 2015 and 2018.

Why Any Recovery Package Must Address Vehicle Efficiency

Sheila Watson
Deputy Director, FIA Foundation

The auto industry has been significantly affected by COVID-19. Vehicle manufacturers shut down factories and showrooms to safeguard workers' health, and sales stalled with vehicle use dropping dramatically. Vehicle manufacturers were already facing challenges: global sales have plateaued for the past five years, with most growth now occurring only in emerging markets. Weak finances, poor consumer confidence as well as rapid developments in electric and autonomous technology have caused significant market disruption.

Governments may now be under pressure to roll back fuel economy regulations to lower production costs. But to do this would be a mistake – increasing total fuel costs and delaying vital action to tackle climate change. **As governments consider economic stimulus and recovery, this is the time to accelerate policies and investments to transform mobility with a focus on efficient, zero emission, low-carbon vehicles.**

Fuel Economy Policy Saves Money

In the EU, net fuel cost savings from adopted policies are expected to be around double the additional cost of efficiency improvements. Across the pond, the Environmental Protection Agency's own modelling of the U.S. light-duty vehicle efficiency standards for 2025-30 originally estimated that $600 spent per vehicle on efficiency would lead to $2,200 in benefits, including $1,400 in fuel savings. The U.S. has subsequently revised its vehicle standards downward, a decision that the International Council on Clean Transportation (ICCT) described as "fundamentally flawed" since any consumer buying a vehicle in 2025 would have recouped their investment in the third year of ownership.

Fuel Economy Policy is Vital for Cutting Carbon Emissions

Transportation uses a large amount of energy and is responsible for just under a quarter of total carbon dioxide emissions worldwide. This means that fuel efficiency measures have enormous potential for energy and emissions savings: **The International Energy Agency (IEA) estimates that fuel economy policies for passenger transport have saved the equivalent of 2.5 EJ of energy between 2015 and 2018.**

The Global Fuel Economy Initiative (GFEI) has undertaken scenario modelling which shows that even with further growth in the total number of vehicles on the road, improvements to internal

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combustion engine vehicles could limit overall emissions at near current levels by 2050, saving five Mtonnes of CO_2eq emissions globally compared with current adopted policies. However, this is not enough to meet our climate goals. A widespread switch to electric vehicles (EVs) is urgently needed. This could achieve further reductions of between three to five Mtonnes – depending on the extent to which the electricity grid is decarbonized.

We Need to Sharpen the Policy Focus on Key Issues

GFEI also monitors trends in average fuel economy over time. Average fuel economy improvements in advanced economies (measured in liters of gas equivalent/km) slowed to only 0.2% per year between 2015 and 2017, and even reversed in almost 20 countries. A significant trend has been the reduction in sales of diesel vehicles in the largest EU markets, where diesel market share has declined by between 5-15% since 2014. This shift away from diesel (which tends to be more efficient) followed the dieselgate scandal, which showed that vehicles emitted far higher levels of dangerous nitrogen oxide emissions on the road than they did in laboratory tests. We need to get our efficiency gains back on track through focused, future-minded policy. There are several ways to accelerate improvements:

- **Encourage smaller vehicle size:** Increasing sales of larger sport utility vehicles (SUVs) have undermined the overall impact of efficiency improvements. According to the IEA, SUVs were the second-largest contributor to the increase in global CO_2 emissions since 2010 after the power sector. The global fleet of SUVs has seen its emissions grow by nearly 0.55 Gt CO_2 during the last decade. North America and Australia have particularly high market shares of large vehicles. However, the largest increases globally have been in the small SUV segment which includes many 'crossover' models. On average, SUVs consume about a quarter more energy than medium-size cars. Using fuel economy standards and financial incentives to reverse this trend could lower overall emissions.

- **Support the transition to EVs:** Electric motors are significantly more efficient than internal combustion engines and will offer increasing climate savings over time as the carbon intensity of the electricity grid improves. However, although there has been some growth in more efficient electric powertrains, these still only make up a small proportion of sales. The latest data from the IEA for 2019 suggests that 2.1 million electric vehicles were sold in 2019, taking the total to 7.2 millon – still just 1% of all vehicles. Fuel economy policy can accelerate the transition to EVs, including through zero emission vehicle mandates, which have been introduced in California and China. Actions taken within the next decade will be key for this transition; although batteries and charging infrastructure are rapidly improving, additional incentives are still needed. Future investment in vehicle manufacturing needs to be focused on the transition to EVs to ensure cleaner mobility.

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- In addition to health improvements, energy-efficient buildings provide additional benefits to people by reducing household energy bills and thus energy poverty, improving access to efficient household appliances, and enhancing resilience to future climatic or economic crises.
- Every million dollars invested in building energy efficiency measures can create between 9 and 30 jobs, many of which require little training and can be rapidly scaled up due to an existing construction workforce.

Accelerating Recovery for People through Building Energy Efficiency

Debbie Weyl
Manager, Buildings Initiative, World Resources Institute (WRI) Ross Center for Sustainable Cities

Energy-efficient buildings are an important key to unlocking recovery from the health and economic crises of COVID-19, as well as a critical solution for addressing the climate crisis. The IEA estimates that sustainable buildings can save more than US $1 trillion by 2050, which will be critical to households, companies, and governments. What's more, much of the extraordinary opportunity to improve the buildings sector – both in the near term and long term – remains frustratingly untapped. Efficiency improvements are a ready intervention, waiting for a simple push that could reap multiple benefits.

While the building sector is often seen as highly technical, action is critical because of its direct impact on people – and people must be the focus of this recovery. So let's start by looking at people, and work backwards to the technical improvements in buildings that can provide real benefits.

People, especially those who live in cities, spend most of their time in buildings. The average person in the U.S. spends 90% of their lives inside. We've seen increasing evidence that airflow and ventilation in buildings is a factor in the spread of COVID-19. Improvements to these ventilation systems – which can be made in conjunction with energy efficiency improvements – can improve people's health and livelihoods. For example, building energy efficiency retrofits can reduce symptoms of respiratory and cardiovascular conditions, arthritis, and allergies. These health impacts far outweigh the costs of upgrades, with benefit-cost ratios as high as 4:1 when health and wellbeing impacts are included.

In addition to health improvements, energy-efficient buildings provide additional benefits to people by reducing household energy bills and thus energy poverty, improving access to efficient household appliances, and enhancing resilience to future climatic or economic crises.

Achieving these benefits requires improvements to millions of homes, office buildings, and other buildings – a fact often seen as a hurdle. But as national, state, and local governments seek ways to kickstart economic recovery after COVID-19, this challenge can be an opportunity. **Every million dollars invested in building energy efficiency measures can create between 9 and 30 jobs, many of which require little training and can be rapidly scaled up due to an existing construction workforce.**

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The IEA's Sustainable Recovery Plan estimates that some 9 million energy efficiency jobs could be created worldwide in the next three years, mostly by renovating buildings.

Energy efficiency is the first building block to decarbonizing the building sector, and more ambitious improvements toward decarbonization can accelerate renovation and construction activity. For example, one study found that a 27% efficiency improvement in buildings in Europe between 2016 and 2030 would create 2 million new jobs.

Since 2015, the Building Efficiency Accelerator (BEA) has accelerated local government implementation of building efficiency and decarbonization policies and programs. In 55 cities and states across 25 countries, the BEA has built stakeholder coalitions led and informed by local partners, using global expertise to improve the building sector. The BEA builds local institutional and technical capacity, enabling governments to set these more ambitious goals that lead to improved outcomes for people.

Energy-efficient buildings bring multiple benefits to people – better health, reduced energy bills, reduced energy poverty, improved resilience, and more jobs – and put us one step closer to the greener, more resilient future we all seek.

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Building Back BETTER with Remote, Rapid Energy Retrofit Analysis

Carolyn Szum
Program Manager, Lawrence Berkeley National Laboratory
Clay Nesler
Vice President of Global Energy and Sustainability, Johnson Controls and Interim President, Alliance to Save Energy

While transportation and industry tend to come to mind when people think of the primary culprits of energy consumption, another sector globally actually tops that list: buildings. The buildings sector is the world's largest source of primary energy consumption – nearly 40% – and ranks second after the industrial sector as a global source of direct and indirect carbon dioxide emissions from fuel. **According to the World Economic Forum, nearly half of all energy consumed by buildings could be avoided with new energy-efficient systems and equipment.**

Traditionally, preparing buildings for energy efficiency retrofits can be a complex, time-intensive, and expensive process which requires on-site energy audits and sometimes energy simulation analysis. These obstacles often delay building owners from pursuing the cost-saving retrofits – and in the age of COVID-19, could prevent progress altogether due to economic setbacks and restrictions on in-person work. However, advancements in the science of data-driven building energy analysis are overcoming these barriers by enabling building professionals worldwide to quickly target energy efficiency improvements remotely and at a lower cost.

In June, Lawrence Berkeley National Laboratory and Johnson Controls released the beta version of the Building Efficiency Targeting Tool for Energy Retrofits (BETTER) – a free, open-source web application available here. By analyzing easily accessible building data and monthly energy usage and weather data, BETTER quickly benchmarks a building's energy use against peers or a portfolio and quantifies energy, cost, and greenhouse gas reduction potential. BETTER is then able to recommend energy efficiency improvements to turn this potential into reality. Additionally, the source code of BETTER's modular, cross-platform analytical engine can be adopted, modifed and redistributed freely under an open-source license, allowing users to incorporate the tool's analytical capabilities into their own software platforms and applications. Any enhancements to the code are shared, contributing to ongoing improvements to the tool.

In this unprecedented time of a global pandemic, BETTER's analysis also can be completed without on-site audits or inspections, enabling energy efficiency workers to continue to plan and develop building retrofit and retro-commissioning

- According to the World Economic Forum, nearly half of all energy consumed by buildings could be avoided with new energy-efficient systems and equipment.

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projects. This can help preserve jobs during a time when nearly 400,000 U.S. energy efficiency workers have been left unemployed because of COVID-19. Moreover, because of the minimal data inputs and easy data entry process, BETTER fosters equity and energy justice by ensuring that detailed no-cost/low-cost and capital improvement recommendations are available for buildings even in the most economically disadvantaged communities.

An earlier version of BETTER has already been used by a variety of organizations, including public school districts, universities, and energy service companies. The World Resources Institute and other Building Efficiency Accelerator (BEA) partner organizations are providing technical assistance and training on the BETTER tool to the BEA network of 55 cities in 25 countries around the world. **BETTER is just one example of countless innovations in energy efficiency science that are making it easier to meet our energy goals and drive job-creating investment.** As leaders worldwide consider how to build back better, they should leverage these recent advancements to enable a faster, more equitable recovery and make the benefits of energy efficiency more accessible for all. Learn more about whether BETTER may be suitable to support your national, state, local, or organizational building efficiency goals here.

• BETTER is just one example of countless innovations in energy efficiency science that are making it easier to meet our energy goals and drive job-creating investment.

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- A recent poll of the Climate Group's 350+ business members showed an overwhelming commitment to sustainability despite the challenges of the pandemic.
- Improving energy productivity is a proven way to add enormous value to global GDP, cut costs, and help companies deliver on their climate commitments. In the troubled seas of the postpandemic economy, business should look to energy efficiency as a life raft.

We Can Recover the Private Sector - While Taking Climate Action

Helen Clarkson
CEO, The Climate Group

The COVID-19 pandemic has hit the private sector hard. 2020 has presented challenges to business communities that no amount of risk management or careful financial planning could have foreseen. As governments across the world tentatively plan for economic recovery, the private sector is still very much struggling – with massive job losses and looming global recession. This might seem like a moment to turn away from climate action, and to push sustainability measures to the bottom of business agendas. However, **a recent poll of the Climate Group's 350+ business members showed an overwhelming commitment to sustainability despite the challenges of the pandemic.** Of the private sector professionals surveyed, 97% said their long-term sustainability strategy remains unchanged.

Nearly all our business members (96%) feel that climate action is just as, if not more, important to their business now compared to pre COVID-19, reflecting an ongoing sense of urgency around climate action. Unless we keep our resolve focused on halving emissions by 2030, we risk more crisis events in the future. **Improving energy productivity is a proven way to add enormous value to global GDP, cut costs, and help companies deliver on their climate commitments. In the troubled seas of the post-pandemic economy, business should look to energy efficiency as a life raft.**

Our EP100 initiative, in partnership with the Alliance to Save Energy, is working with a leading group of energy-smart companies committed to improving their energy productivity to drive wider corporate action. On-site energy generation, retrofitting buildings with efficient LED lighting, and installing upgraded insulation can improve a building's efficiency level to over 90%.

Working toward more energy-smart buildings is particularly timely in 2020. With lower occupancy and use of commercial and industrial buildings as many companies continue to work remotely, there is a unique moment of opportunity to refurbish and retrofit workspaces. Working with the World Green Building Council, businesses can join EP100 via the Net Zero Carbon Buildings pathway, committing to owning, occupying and developing buildings that operate at net zero carbon emissions by 2030. EP100 companies are adapting and rethinking ways of working toward more energy-smart buildings. Our members know that action is not optional, and it's been great to see EP100's membership grow

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despite the challenges of the pandemic with 13 companies joining on World Environment Day in June.

More productive use of energy in commercial and industrial buildings also generates significant savings for businesses – more important than ever in the current climate. As companies look for every opportunity to cut costs and improve profitability, shareholders should be asking their companies what commitments they are undertaking to create more energy-efficient workspaces. Businesses can look to EP100 for examples of corporate leadership in this field. Fashion retailer H&M, a member of EP100 since 2017, cut electricity use in stores by over 10% in three years and has saved over €120,000 from replacing 9,250 lightbulbs with LEDs. The EP100 Cooling Challenge helps our business members play a leading role in mitigating climate impact by investing in energy-efficient cooling that will also generate substantial financial savings.

Implementing energy efficiency measures in buildings can help turn the financial troubles of 2020 into financial savings – creating new green collar jobs, reducing energy bills, and cutting costs. A recent report by the International Energy Agency (IEA) on sustainable recovery in the energy sector found that energy efficiency measures would deliver the largest overall emissions reductions, and that $1 invested in energy efficiency generates $2 of savings. Businesses can boost their bottom line at a time when this is sorely needed. Energy efficiency initiatives like EP100 are more important than ever to help the private sector get back on its feet – and now is the opportune moment to sign up.

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- BANK OF AFRICA's uptake of sustainable energy finance can be traced back to its long-held conviction that the financial sector has a fundamental role in the achievement of sustainable development goals, including the transition to a low-carbon future.

BANK OF AFRICA: Committed to Sustainable Energy Finance

Amal Benaissa, PhD
Manager of Sustainable Finance at BANK OF AFRICA - BMCE Group,

As the world continues to wrestle with the COVID-19 pandemic, climate risks and the transition to a green economy remain at the heart of BANK OF AFRICA - BMCE Group's priorities. Over the past 15 years, the pan-African banking group with Moroccan roots has consolidated its position as a regional sustainable finance pioneer actively committed to contributing to the energy transition in Morocco and across the African continent.

Well aware of the rising national energy challenges in Morocco, BANK OF AFRICA has continuously financed projects related the implementation of the national energy strategy, which includes Law 99-12 regarding sustainable development, Law 47-09 on energy efficiency, and Laws 13-09 and 58/15 on the development of renewable energy.

BANK OF AFRICA's uptake of sustainable energy finance can be traced back to its long-held conviction that the financial sector has a fundamental role in the achievement of sustainable development goals, including the transition to a low-carbon future. In 2000, BANK OF AFRICA became the first African signatory of the United Nations Environment Programme Finance Initiative (UNEP FI) Statement and in 2019 re-affirmed its stance by becoming a Founding Signatory of the "Principles of Responsible Banking."

The Group further signed on to the European Bank for Reconstruction and Development (EBRD) and UNEP FI "Statement by Financial Institutions on Energy Efficiency Finance" in 2015, pledging to increase investment in clean energy, and to date has financed major wind energy and desalination projects. BANK OF AFRICA also issued a Green Bond in 2016 during COP22 to finance energy efficiency and renewable energy projects.

BANK OF AFRICA's Sustainable Energy Solutions for SMEs: MorSEFF / MorGEFF Programs

BANK OF AFRICA contributed to co-creating the energy efficiency market in Morocco when it became the first Partner of the Morocco Sustainable Energy Efficiency Financing Facility (MorSEFF), a dedicated financing facility for small and medium-sized enterprises (SMEs) and corporations. MorSEFF was developed in 2015 with EBRD, EIB, KfW, and AFD with the support of the European Union. The Bank later signed onto a similar facility in 2017 – the Morocco Green Economy Financing Facility (MorGEFF) – in partnership with EBRD, with a grant from the Green Climate Fund.

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The Bank's "Cap Energy" product was born out of these programs and to date has disbursed more than 65 million Euros in sustainable loans to SMEs.

Customers benefitted from a unique blended package offering financing, free technical assistance including a free energy audit, and an investment bonus that increased the appetite for this new market. Positive spin-offs for clients were applicable in multiple industries including transport, industry, and construction.

In parallel, the Bank raised awareness among its customers through roadshows and seminars encouraging low-energy technologies, focusing on renewable energies and strengthening local production.

In 2017, BANK OF AFRICA was awarded the Sustainable Energy Gold Award by the EBRD in recognition of its commitment to green and inclusive growth through the MorSEFF program, impacting more than a hundred companies across all regions in Morocco.

Post-COVID 19: Looking Ahead to a Sustainable Economic Recovery

As investment activity weakens and SMEs focus on their survival in light of the pandemic, it is important to invoke the financial advantage of energy efficiency as the proverbial lowest-hanging fruit, meaning that energy savings can be more easily translated into financial savings for companies and industry.

In a post COVID-19 reality, cutting costs from resource utilization – energy, water, waste – is more pertinent than ever as clean technological innovations accelerate, and especially in the MENA region where climate risks are vital.

Bespoke programs such as MorSEFF and MorGEFF must continue to be offered in Morocco and other parts of the African continent in partnership with commercial banks like BANK OF AFRICA, with the support of DFIs, MDBs, and other grant donors, to boost investment in energy efficiency and enable positive impacts on the economy, the environment, and society.

Looking ahead, BANK OF AFRICA remains firmly committed not only to the immediate health and economic emergency, but also to a sustainable recovery, and will continue to sow partnerships to refine its sustainable financing solutions to better support SMEs and corporations during and after the pandemic.

BANK OF AFRICA - BMCE Group, is a regional leader and pioneer in sustainable and inclusive finance. With a passion to contribute to the development of Positive Impact Finance in Morocco and across the African continent, Amal Benaissa's work involves developing innovative financial products, services and partnerships that yield positive environmental and/or environmental impacts.

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A Message from Signify

Hidalgo Wind Farm in McCook, Texas (EDP Renewables North America LLC)

- "Only 1% of buildings undergo renovation each year which is a huge missed opportunity," Harry Verhaar added. "If we bring this renovation rate to 3% per year, we will slash the energy consumption of our building sector, create local skilled jobs, and improve the quality of life for EU citizens."

- "This is not a time to pause and celebrate but a time to become even more ambitious and accelerate our efforts to address these challenges," CEO Eric Rondolat insisted. "Growth for sustainability and providing a great place to work are firmly anchored as central parts of our company strategy."

Carbon Neutrality: The New Normal for Signify

The lighting company wants to move "beyond" carbon neutrality in its next set of commitments

Harry Verhaar
Head of Global Public & Government Affairs

Signify

Signify (Euronext: LIGHT), since 2018 became the new company name for Philips Lighting and is the world leader in lighting for professionals and consumers and lighting for the Internet of Things. Our Philips products, connected lighting systems and data-enabled services, deliver business value and transform life in homes, buildings and public spaces. With 2019 sales of EUR 6.2 billion, we have approximately 32,000 employees and are present in over 70 countries. Information for investors can be found on the Investor Relations page.

Five years since announcing its commitment to COP21 delegates in Paris, Signify has become 100% carbon neutral.

The company, formerly known as Philips Lighting, has reduced its operational emissions by more than 70% since 2010, making it the first major lighting company in the world to reach carbon neutrality. Energy efficiency has played a key role in this accomplishment.

It's also committed to a new journey which will see it focus on "doubling its positive impact on the environment and society" through a five-year sustainability programme.

"We would like to congratulate Signify on their fantastic achievement of carbon neutrality across all operations in 2020," said Helen Clarkson, CEO of The Climate Group, in a recent company press release.

"We have been working in partnership with Signify for over 10 years to accelerate the global adoption of energy efficient LED lighting and through Signify's support of RE100 and EV100," she added.

Turning a Vision into Reality

The company has met its targets through moving all its global markets to sustainable methods of operation and aligning with goals set out in the Paris Agreement.

Speaking on its approach, chief executive Eric Rondolat said, "it's been a collective effort as we shifted to more energy-efficient technologies, optimised logistics, reduced our business travel and moved to 100% renewable electricity."

It's energy efficiency that has been a particular focus for Signify, having transitioned to advanced technologies in offices and factories, as well as looking at more sustainable transport modes.

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Brighter Lives, Better World (YouTube video uploaded by Signify)

The company's car fleet, for example, is moving to electric vehicles and its buildings are being powered by electricity created from renewable energies; made possible through two virtual power purchase agreements. In 2016, Signify signed a deal with a windfarm in Texas to reduce carbon emissions in the States and late last year the company made an agreement to purchase at least ten years of electricity from an onshore Polish windfarm that generates around 92 Gigawatt hours annually.

In 2017, Signify was the first major international company to secure a renewable energy deal in the Gulf region using the pioneering International REC, a renewable energy documenting standard used in regions where no similar documentation scheme exists.

To close its emissions gap, Signify has been involved in a number of carbon offsetting programmes through its offsetting partner South Pole. These have "reduced environmental impacts and increased the well-being of local communities," including a reforestation project in Colombia, and an off-grid solar energy programme in India to give rural populations more access to light. The news is also proof that eco-economic decoupling is possible, as a previous CHN article on the significance of LED lighting looked at.

"It's a great reminder that growth and energy consumption need not go hand in hand," said Harry Verhaar, Signify's Head of Global Public and Government Affairs, adding "they can be decoupled, enabling socio-economic development while at the same time contributing to protecting our climate."

The company has long-promoted decoupling through the use of LED lighting, which is up to 80% more energy efficient than conventional lighting, as well as through developing new products like solar-powered streetlights that can also decrease luminosity when there's no footfall.

Signify has also had building renovations as a focus in its fight against climate change. The EU building sector is responsible for 40% of the region's energy consumption and 36% of its greenhouse gas emissions; "building renovation is therefore a vital short-cut to achieving a carbon neutral world," argues Verhaar.

"Only 1% of buildings undergo renovation each year which is a huge missed opportunity," Verhaar added, "if we bring this renovation rate to 3% per year, we will slash the energy consumption of our building sector, create local skilled jobs, and improve the quality of life for EU citizens."

The company has called on governments and municipalities to show leadership by committing to energy savings in their own buildings and joining initiatives like the Net Zero Carbon Buildings (NZCB) programme and switching ministerial car fleets to EV's through the EV100.

What's Next?

Despite the global economic slowdown brought on by the coronavirus pandemic, Signify has now committed to embark on a new five-year journey that will go "beyond" carbon neutrality and double its positive impact on the environment and on society. "This is not a time to pause and celebrate but a time to become even more ambitious and accelerate our efforts to address these challenges," Rondolat insisted. "Growth for sustainability and providing a great place to work are firmly anchored as central parts of our company strategy."

The Brighter Lives, Better World 2025 programme will work towards doubling the pace of the Paris Agreement, its circular revenues, its proceeds to innovations that benefit society, and its percentage of women in leadership, within the next five years.

The integrated initiative touches on six of the UN Sustainable Development Goals; Good Health and Well-Being, Affordable and Clean Energy, Decent Work and Economic Growth, Sustainable Cities and Communities, Responsible Consumption and Production, and Climate Action.

"The 2020's are the Climate Decade as we need to halve global emissions by 2030 to get us on track to meet the goals of the Paris Agreement," Climate Group's Clarkson said, "so we need more companies to follow Signify's lead in setting their own net zero targets."

How smart is your workspace?

The Edge, Amsterdam, the Netherlands

Interact Office turns any office into a smart office

New insights gained via data collected from the connected lighting system are at the heart of Interact Office. Transform your office into a smart and sustainable workplace. Make building operations more efficient, optimize your space and enhance employee performance and engagement. Energize employees and facilitate collaboration with apps for personalizing lighting and improve productivity through apps that locate free meeting rooms and workspaces.

interact Office

Find out more about Interact Office
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