

HOW TO BUILD A MORE ENERGY-EFFICIENT SOCIETY

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KEY TAKEAWAYS

Countries wishing to nurture a more energy-efficient society may need to implement policies and programmes that encourage smarter energy use.

Financial incentives, regulations and standards, technology and education can all be leveraged to promote efficiency.



On the approach to 2030, the world has several steep challenges to summit in pursuit of its climate action goals. Bringing carbon emissions down to acceptable levels is a demanding task because it requires strong political will, major energy market shifts and rapid technological innovation. However, even as we focus on these areas, experts have signalled that we can achieve quick and important wins with comparative ease if we pay greater attention to an underestimated energy ‘source’ – energy efficiency.

Energy efficiency (EE) maximises available energy supply, by reducing waste and using power and fuels more thoughtfully, so that less energy is spent to do the same work. It involves both upgrades to systems and machines to reduce their energy intensity or appetite and behavioural changes on the part of the consumer. More efficient energy use – be it in industry, power generation, the commercial sector or households – not only helps cut energy bills, but lowers the carbon emissions associated with consumer activity. In this way, it helps

emissions while still meeting the energy demands of modern society – EE essentially liberates more supply without creating more emissions.

That said, it is largely the consumers of energy who must make adjustments to achieve EE gains, and they can sometimes require incentives or a societal or legislative push before they submit to the perceived inconvenience of change. For this reason, countries wishing to nurture a more energy-efficient society may need to implement policies and programmes that encourage smarter energy use.



HOW CAN WE BUILD A MORE ENERGY-EFFICIENT SOCIETY?

Financial incentives

Cost and consumption are closely linked. In Trinidad and Tobago, the cost of electricity has been kept artificially low through subsidies. Over the years, this has contributed to our country's competitive advantage as an investment destination, but it has also bred a culture of waste and inefficiency. If power is cheap, there is little incentive to use less of it.

Reduction or removal of the subsidy on electricity is therefore seen as a mechanism to encourage greater energy efficiency. Intuitively,

consumers with fixed incomes and budgets will be sensitive to price changes and will adjust their purchasing and consumption if energy prices go up. The aftermath of the Russian invasion of Ukraine provided a clear illustration of this – faced with skyrocketing energy prices, individuals, businesses, and even factories embarked on various energy-saving initiatives that played an important part in Europe's 13% reduction in gas demand in 2022.¹

While the removal of subsidies on power and fuels can be effective drivers of change, measures must be put in place to ensure the energy security of vulnerable segments of the population is not compromised by price hikes. That is, energy should still be affordable and accessible to all.

Another approach can be to introduce subsidies or mechanisms that *encourage* EE. For some consumers, the cost of upgrading machinery or appliances to more efficient options can be prohibitive. Governments can help absorb some of those upfront costs for industrial, commercial and household consumers through subsidies, grants, tax credits or other facilities. Trinidad and Tobago's lightbulb exchange programme – which offered citizens free LED bulb replacements for incandescent ones – is a good example of this. Also useful are the country's tax concessions on renewable energy technologies such as solar water heaters (which ultimately help reduce grid demand)² and the 35% rebate offered to consumers whose electricity bills fall below TT\$300.³

¹<https://www.iea.org/commentaries/europe-s-energy-crisis-what-factors-drove-the-record-fall-in-natural-gas-demand-in-2022>

²<https://www.finance.gov.tt/wp-content/uploads/2017/08/MOF-Investment-Incentives-in-Trinidad-and-Tobago-web.pdf>

³<https://ttec.co.tt/default/bill-rebate-faqs#:~:text=The%20programme%20provides%20a%2035,be%20used%20to%20liquidate%20arrears.>

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Regulations and standards

Even though financial incentives can be effective EE drivers, they are often optional and consumers can still choose to overlook them. When EE is driven by regulations, that choice is eliminated. In many countries, governments have enacted policies that mandate greater attention to EE.

IN FACT, THE WORLD TRADE ORGANIZATION REPORTED THAT SINCE 2009,

OVER 1,180 ENERGY EFFICIENCY AND CONSERVATION REGULATIONS

HAVE BEEN NOTIFIED TO THE ORGANISATION BY OVER 70 OF ITS MEMBERS.⁴

THE WTO FURTHER NOTED THAT SUCH REGULATIONS HAVE **“ALREADY REDUCED ANNUAL ENERGY-RELATED EMISSIONS BY**

12% IN THE 2000-17 PERIOD, AND POTENTIALLY DELIVERED

OVER 40% OF THE ABATEMENT REQUIRED TO BE IN LINE WITH THE PARIS AGREEMENT TARGETS BY 2040”.⁵

⁴https://www.wto.org/english/res_e/booksp_e/tptfca_05_03_regulations_and_certification_e.pdf

⁵ibid

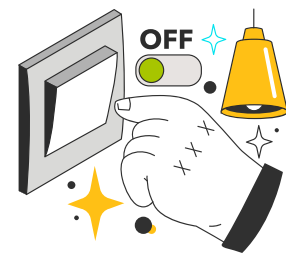


Building codes are one example of such regulations. These establish minimum EE requirements for new construction and renovations, outlining guidelines for building materials, fixtures, design and operation. In other words, they compel developers to think carefully about how their new builds and retrofits will consume energy.

IN THE USA, BUILDING ENERGY CODES ARE PROJECTED TO GENERATE US\$126 BILLION IN CUMULATIVE ENERGY COST SAVINGS BETWEEN 2010 AND 2040, WHILE ALLOWING THE EMISSIONS EQUIVALENT OF 245 LARGE COAL-FIRED POWER PLANTS TO BE AVOIDED.⁶

EE standards and requirements on certain consumer goods are another notable example. Many regions have established minimum energy performance standards (MEPS) for appliances and equipment and/or mandatory EE labelling requirements, which can push products that are energy *inefficient* out of the market.⁷ In February 2024, the Trinidad and Tobago Bureau of Standards announced the completion of the Quality for Sustainable Energy in the Caribbean (QSEC) project that, among other things, launched a laboratory for testing lighting products for energy efficiency. Plans are also underway for enforcement of the mandatory national energy efficiency labelling standard for LED and CFL bulbs to protect consumers.

Some regulations can even target behaviours. In India, regulations for air conditioners require manufacturers to set the default temperature of a new device to 24°C. Although consumers are free to adjust the temperature, many retain the default setting and save energy without even realising it.⁸



Leveraging technology

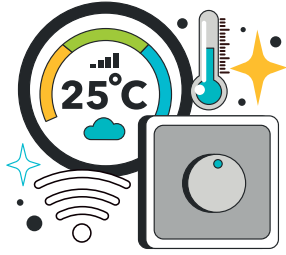
Much of the inefficiency in energy use derives from human negligence, oversight or poor judgment – we forget to turn off lights, we use air conditioners to cool empty rooms, we leave devices plugged in even when they are not being used.

⁶<https://www.forbes.com/sites/energyinnovation/2020/12/02/a-powerful-yet-underused-climate-tool-building-codes/?sh=658ed02ad978>

⁷<https://www.iea.org/energy-system/buildings/appliances-and-equipment>

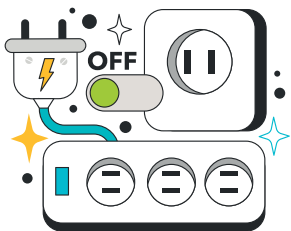
⁸<https://www.iea.org/commentaries/accelerating-energy-efficiency-what-governments-can-do-now-to-deliver-energy-savings>

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Fortunately, there are many ‘smart’ devices and gadgets available today that can help reduce this type of energy wastage. Smart plugs, for example, can be used to set routines for appliances and lighting, switching them off when they are not being used. Motion sensor lighting is designed to come on when human movement is detected in an indoor or outdoor space and turn off when no movement is detected. This, coupled with LED lighting fixtures, can significantly impact energy usage, particularly in offices where lights are traditionally left on for 24 hours.

At the jurisdictional level, investment in ‘smart grids’ can greatly support energy efficiency. A smart grid is an electricity network that uses digital and other advanced technologies to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end users.⁹ These grids help coordinate supply and demand to maximise efficiency and system reliability. They incorporate tools such as smart meters, that relay information about consumption patterns back to network administrators, enabling



better management of power distribution throughout the day. Data collected through smart grids can allow utilities to introduce dynamic pricing for power, with higher rates charged during peak demand hours. Studies have shown that such ‘peak pricing tariffs’ can help lower demand, as consumers exercise greater discretion when using power at its most expensive.¹⁰



Education

Perhaps one of the most fundamental and effective approaches to achieving energy efficiency is conditioning the public to embrace it as a societal norm. Education is key in this regard. Countries have rightly recognised that responsible energy behaviours must be ingrained from a young age through school curricula. Children can help influence the consumption patterns of their homes (as anyone who has lived with an insistent toddler can attest). At the higher levels, educational institutions should offer more technical and vocational training around skill sets that will be needed for implementing and managing EE architecture, such as smart grids.

Public information and awareness campaigns are also useful. In Trinidad and Tobago, NGC has initiated a broad-based, multimedia campaign promoting ‘Small Steps to Change’, with videos and literature encouraging citizens to adopt more sustainable behaviours, including energy conservation.

NGC also introduced the Energy SmartTT app in 2020 – an energy education tool that allows users to track their energy consumption, particularly at the domestic level, and learn about the big picture environmental impact of personal choices.

It is important, however, that knowledge-sharing goes both ways. EE strategies target the end users of energy, seeking an adjustment in their consumption habits, so public consultation and involvement are crucial. Knowing exactly how people use energy will allow for the development of more targeted and effective interventions. For example, if a hypothetical 20% of the population spends half their electric bill on water heating, then that would be a good area of focus for regulation and education.



⁹<https://www.iea.org/energy-system/electricity/smart-grids>

¹⁰https://web.mit.edu/energy-efficiency/docs/EESP_ArchSmartGridForEE.pdf

New Episodes of SMALL STEPS TO CHANGE



Moreover, to the extent that people need to participate in the process of change (for instance, agreeing to purchase a new water heater), they must first be convinced of the benefit — they must buy into the idea. For this reason, esoteric policies that are far removed from the day-to-day realities of citizens will not succeed — people need to see the direct

impact on their lives. Involving the public in the process of planning for our energy future should therefore be a priority.

Collective impact

There is no doubt that energy efficiency will be a pillar of the energy transition — it is a low-cost solution that once amortised, works from both an environmental and

economic standpoint. It is imperative that governments looking to seize this low-hanging fruit in their quests for carbon neutrality recognise that public engagement and participation are indispensable for success. EE initiatives might rely heavily on individual choices and actions, but it is ultimately *collective* impact — the cumulative societal push — that will move the dial. ■

