



Energy Sufficiency

The missing lever to tackle the energy crisis

• Introduction

We are now living in a new era of **insecure** access to **expensive** and **polluting** fossil fuels.

Since the summer of 2021, fossil fuels have become expensive. Prices have reached very high levels.¹ Initially triggered by the global post-covid recovery, the prices are now entrenched in the new geopolitical reality that Europe is facing. Vladimir Putin's second invasion of Ukraine exposed the European dependence on fossil energy from Russia.² Oil prices are likely to remain high for the next years. European gas prices will most likely never come back to pre-crisis levels due to the increased reliance on Liquefied Natural Gas (LNG).

With the onset of the Russia-Ukraine war, **EU access to fossil fuels has become visibly insecure**. Before, Russia exported around 25 % of the energy consumed in the EU, with 25 % of oil, 40 % of gas and 45 % of coal

imports coming from Russia.³ Now, Vladimir Putin has threatened to cut gas supplies to the EU and acted on that threat by cutting gas supplies to two EU member States, Poland and Bulgaria, on April 27th 2022.⁴

At the same time, the burning of fossil fuels increases the **carbon dioxide concentration in the atmosphere that leads to global warming**. In April 2022, the United Nations' International Panel on Climate Change (IPCC) confirmed the urgency of the energy transition⁵. In order to avoid catastrophic climate change we need to halve global greenhouse gas emissions in the next eight years. This requires an emissions reduction of -6 % every year, which is more than the 2020 reduction brought about by global COVID lockdowns⁶.

In the vast debate on how to end this era of **insecure** access to **expensive** and **polluting** fossil fuels, this policy brief focuses on the important –albeit most forgotten– solution: energy sufficiency.

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Leon Leuser
Research Fellow for
Energy Sufficiency
at the Jacques
Delors Institute

**Thomas
Pellerin-Carlin**
Director of the
Jacques Delors
Energy Centre,
Senior Research
Fellow, European
Energy Policy

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I • Sufficiency policy: a definition

Simply put, energy sufficiency is about reducing energy consumption through changes in behaviour.⁷ The aim of sufficiency is to “avoid demand for energy, materials, land and water while delivering human wellbeing for all within planetary boundaries”.⁸ With its twofold sense of “enough”, sufficiency considers a social minimum level of resource and energy demand and an environmental upper threshold at the same time.⁹

The table below illustrates sufficiency against the strategies of efficiency and consistency. The latter two aim to reduce the energy and resource input through engineering solutions. In contrast, sufficiency implies changes in the amount and type of product or service consumed. **We need an ambitious combination of all three to achieve climate goals and energy security.**

The concept of sufficiency recently gained traction with two major international organisations. Both the International Energy Agency¹⁰ and the recent IPCC report¹¹ present sufficiency as a key solution¹² for energy

security and climate mitigation. Differing terms such as behaviour¹³, lifestyle¹⁴ or cultural change, demand-side measures and material efficiency¹⁵ are used to describe similar proposals that we summarise here with the term sufficiency.¹⁶

Nevertheless, there are differences between those terms and concepts. “Behaviour change” gives the responsibility to citizens to switch to “green” consumption options. But taxing train rides, while exempting aeroplane tickets is a taxation choice that favours polluting behaviour. Similarly, allocating most of city infrastructure to cars limits the space and speed of cleaner modes of transportation, such as buses, cycling or walking.

Indeed, **collective choices such as taxation, infrastructure, legal and social norms, shape individual behaviours.**¹⁷ Today, our decisions in everyday life are systematically steered towards choices that entail resource depletion and greenhouse gas emissions. **Consequently, sufficiency policy stresses the need for structural changes to steer individual and societal actions towards climate neutrality.**

TABLE 1. Sustainability strategies for exemplary products and services⁴⁴

Current mainstream consumption option	Sufficiency	Efficiency	Consistency ⁴⁵
Take the car with combustion engine	Cycle, public transport, ride sharing, car sharing	Electric car	Electric car with renewable electricity, combustion engine car with renewable fuels
Take a plane, including with stopovers	Choose video-conference, or travel with a (night-)train	Take only direct flights and/or increase the efficiency of the plane	Plane with renewable fuels and direct air carbon capture and storage
Heating the house at 22°C with a fossil fuel boiler	Lower temperatures (<19°C), heat less rooms	Invest in the deep thermal renovation of a building	Install a renewable heating system (e.g. solar heating, heat pumps, etc.)
Washing and drying clothes	Cold wash your clothes, line dry	Use a A+++ washing machine and tumble dryer	Use renewable electricity for washing and tumble dryer

II • Sufficiency policies are the only policies that yield immediate geopolitical, climate and economic benefits

Sufficiency policies entail various advantages as a strategy to tackle the current energy crisis as well as the climate emergency, such as:

1. immediate reductions in energy demand;
2. low costs of implementation;
3. keeping energy prices in check;
4. reducing the costs for the transition to climate neutrality;
5. and co-benefits such as improved health.

To support sufficiency behaviours that reduce the energy demand immediately, information campaigns that stimulate voluntary adoption of citizens have proved to be efficient. The success during past energy crises - from the oil crisis in the 1970s to post-Fukushima Japan in 2011 - shows their potential. **Japan reduced its electricity demand successfully with the “Setsuden” campaign in 2011 and avoided blackouts.**

Most short-term sufficiency measures are free or low-cost. In general, they do not require new investments or new technologies that would entail development time, capital and production capacities. For instance, transforming a street made for car traffic

into one for buses, cyclists and pedestrians requires small upfront investment costs, and reduces the long-term maintenance costs. Other sufficiency measures for the medium and long-term can imply significant cost and time, for example for expanding train infrastructure.

By reducing energy demand, sufficiency measures help reduce energy prices. **This supports European consumers and industry to cope with the current high costs of energy.** Demand for energy is very inelastic in the short term. This means that consumers respond slowly to (strong) price increases.¹⁸ Households' vulnerability to price increases of gas and electricity is exacerbated as consumption tends to be only billed once per year. Price signals do not work in this case. By inducing demand reductions through e.g. a campaign can help to guard citizens against indebtedness¹⁹.

The effect of price mitigations through consumption reduction goes beyond Europe. As the EU is switching to gas supply via LNG, prices increase globally. This leads to a shift to coal use particularly in Asia, where LNG is important for the gas supply. Thus, demand reduction in Europe can reduce the rise in global greenhouse gas (GHG) emissions by mitigating price increases in the LNG market.²⁰

BOX 1. Fukushima and Setsuden ⁴⁶

In March 2011, three meltdowns occurred in the Fukushima nuclear power plant after a strong earthquake and a subsequent tsunami hit the plant. As a reaction to this, the government shut down further power. **Faced with power outages in the following summer, the government adopted an electricity savings campaign called “Setsuden” (japanese for “saving electricity”).** For households and small businesses, setsuden relied on voluntary reductions and self-set targets. **Companies with a demand above 500 kilowatts, however, were obliged to reduce demand by 15 % or even 30 % for larger companies.**

Besides switching to private electricity generation, **companies incentivised their employees to reduce consumption.** For example, dress codes were eased to increase the temperature using less air-conditioning. Work hours or even workdays were shifted to avoid peak demand. Furthermore, unnecessary lighting e.g. for exhibition and display, was switched off. Trains ran slower and escalators were stopped. Billboards were not allowed for advertisement except for showing current level of electricity saving efforts.

Setsuden successfully decreased peak demand by 20 %. While the campaign focused on the most affected Eastern Japan, electricity demand in the whole country decreased by 7.6 % in the summer of 2011 and 9.1 % in the summer of 2012.

The transition towards a climate neutrality requires the electrification of heating and transport. Europe will need to build up enormous capacities of renewable energy and storage. **Every kilowatt-hour saved decreases the required capacity for reaching climate neutrality.** The European Commission estimates that reduced energy demand through “behaviour change” could reduce annual investments by one third to €175.7 billion.²¹

Furthermore, sufficiency measures entail various co-benefits for citizens, such as improved health, less noise or financial savings.²² **Wellbeing improvements are most notable in health.** Examples are the improved outdoor air quality in cities due to reduced motorised mobility and more active mobility.²³

III • Sufficiency in the energy crisis: Save gas, electricity and oil!

The dependency on Russian energy imports is most critical for fossil gas. This is because the EU faces enormous challenges in efforts to diversify supply for this energy source.²⁴ In the EU, gas is mostly consumed in three sectors: 1) in private homes and businesses for heating and warm water (35 %); 2) in industry as a raw material and for high temperature processes (23 %); and 3) in the power sector for electricity (and heat) generation (31 %).²⁵

Short-term sufficiency measures to reduce EU gas consumption include lowering temperatures, heating fewer rooms, reducing boiler temperature, installing smart thermostats or water-saving shower heads.

Reducing electricity consumption helps to decrease the amount of fossil gas burnt for generation. European countries with high shares of natural gas in electricity generation are Italy (47 %), Ireland (54 %), Netherlands (59 %), Malta (89 %) and Spain (31 %).²⁶ But gas power plants are used in all EU countries to adapt generation to the demand. Two Megawatthours of fossil gas are burnt for one Megawatthour of electricity. Electricity consumption is split in almost equal parts for households, industry and services.

Short-term sufficiency measures to reduce electricity demand: Households can significantly reduce demand by using less/no air conditioning, drying clothes on a line, switching to cooler washing temperatures, switching off electric water boilers for taps and the freezer, increasing the temperature in the fridge or using a smaller fridge, and only boiling the amount of water needed.

Reducing oil demand helps to mitigate price increases and economic costs in the current crisis. Even if some oil is used for heating, and as a raw material for industrial processes, most of the oil used in Europe is burned for transport. **Short-term measures to reduce oil consumption, therefore, need to focus in particular on the transport sector.** A starting point could be the prolonging of measures taken during the corona pandemic such as remote working or pop-up bike-lanes. Further measures proposed by the International Energy Agency (IEA) and others²⁷ include car-free Sundays, incentivizing ride sharing or banning short haul flights.

To act fast in times of crises, policy makers need to propel campaigns and measures that can be implemented in the short-term. In any case, **honest and sensible communication is key for success.** Messages should focus on “excess consumption” rather than putting pressure on those already in a precarious situation.²⁸ This means targeting above average consumers, which are wealthier and better educated.²⁹ **Opinion leaders - actors, football players, trade-unionists, business leaders, teachers, mayors, religious leaders - should act as role models.**³⁰ From past examples,^{31,32} such as setsuden, we can **expect energy savings of potentially up to 25 % in the short-term from such campaigns.**³³

Many short-term gains can be enshrined in social norms and render crisis behaviours structural to attain long-term effects.³⁴ This can be encouraged through diverse measures like price incentives and infrastructure expansion for clean consumption choices. **For such long-term measures, the IPCC highlights the potential to reduce energy demand and GHG emissions by 40-70 % by 2050.**³⁵

IV • Recommendations: What could the European Union do?

Sufficiency has the potential to reduce EU gas, oil and electricity demand significantly, by up to 25 % in the short-term. It entails multiple benefits such as short-term effectiveness and price mitigation, supporting European purchasing power and health benefits.³⁶ The EU and its Member States, as well as regions, cities, companies and individual families, should therefore act immediately and implement measures to save energy.

Within its REPowerEU energy savings action plan the European Commission should call for **a voluntary energy consumption reduction target of at least 15 % for oil, gas and electricity** from Member States.³⁷ In response, Member States should adopt a conclusion in the Council on these voluntary targets. The common challenge and joint effort should motivate Member States to then adopt adequate measures on the national level to achieve reduction targets.³⁸

The European Commission should prepare a comprehensive template for an **energy conservation campaign** based on the joint report with IEA “Playing my part”.³⁹ Messages should take into account the capability to reduce energy consumption and potential effects. As a part of this the Commission could **call on companies and opinion leaders to publicly announce self-set energy saving targets in order to initiate a positive competition for higher savings.**

The European Commission should lead by example and set itself an energy savings target of at least 25 %. This means air tra-

vels should be reduced to a minimum and home office made possible at least four days per week. Dress codes should be softened to allow for reducing the heating of its buildings to 17 degrees and air conditioning restricted to days with temperatures above 30 degrees.

The European Commission should adopt at least a **weekly energy consumption communication.** Continuous communication proved an effective measure of governments to uphold awareness of citizens during the pandemic.⁴⁰ The Commission should require Member States to submit weekly updates of current consumption and storage levels to communicate those.⁴¹ In addition, the Commission can present best-practice measures implemented by Member States.

The European Commission should **propose a temporary ban on advertisement for particularly energy intensive consumption choices.**⁴² Such choices comprise for example air travel and SUVs.⁴³ For fast effectiveness, Member States need to implement the ban for the period of the energy crisis. This ban supports the energy saving campaign, which is contradicted by such advertising.

Next to these short-term measures, the Commission should seek to make energy savings permanent. **To this end, the Commission needs recognize sufficiency as an important lever** next to efficiency and renewables. It should exploit the maximum potential of all three at a maximum with ambitious proposals for the Green Deal. Thereby, the EU will phase-out fossil fuels faster, increase the energy security and independence of Europe as well as deliver its fair share for global climate mitigation •

• Notes de fin

- 1 Natural gas prices until 2019: 20-30 €/MWh, reached up to 150 €/MWh. Thomas Pellerin-Carlin, Phuc-Vinh Nguyen (2021): [The European Energy Price Spike - Overcoming the Fossil Fuel Crisis](#). Jacques Delors Institute Policy Brief October 2021.
- 2 Pellerin-Carlin, Thomas (2022): “Stop feeding the bear. The case for a smart embargo on Putin’s oil and gas”, Blogpost, Paris: Jacques Delors Institute, 9 May.
- 3 All are 2019 data. April 2022 figures are much lower. Maciej Miniszewski (2022): [Could the EU survive without Russian energy imports?](#), London School of Economics, LSE blog.
- 4 [Europe decries ‘blackmail’ as Russia cuts gas to Poland, Bulgaria | Reuters](#)
- 5 IPCC (2022): [Climate Change 2022. Mitigation of Climate Change](#). Summary for Policy Makers. Working Group III contribution to the Sixth Assessment Report of the IPCC
- 6 [COVID curbed carbon emissions in 2020 – but not by much \(nature.com\)](#)
- 7 Due to the scope of this brief, the authors give a simplistic definition of sufficiency, but embraces the definitions of IPCC (2022), Öko-Institut (2013) and Princen (2005). Particularly the latter two expand the scope of the concept of sufficiency to be

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- Öko-Institut (2013): [Suffizienz. Begriff, Begründung und Potentiale](#). Öko-Institut, Freiburg.
- Princen, Thomas (2005): *The logic of sufficiency*. Vol. 30. Cambridge, MA: Mit Press, 2005.
- 8 Footnote 60 on page 41 of IPCC (2022): Climate Change 2022. Mitigation of Climate Change. Summary for Policy Makers. Working Group III contribution to the Sixth Assessment Report of the IPCC
- 9 Spengler, Laura (2016): "Two types of 'enough': sufficiency as minimum and maximum." *Environmental Politics*.
- 10 An example is IEA (2022): [A 10-point plan to cut oil use](#). International Energy Agency, Paris.
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- 14 IGS, Aalto University, and D-mat Ltd. (2019): *1.5-Degree Lifestyles: Targets and Options for Reducing Lifestyle Carbon Footprints*. Technical Report. Institute for Global Environmental Strategies, Hayama, Japan
- 15 IRP (2020): *Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future*. UNEP, Nairobi, Kenya.
- 16 The term used in the French debate "sobriété" is sometimes also translated in English as "sobriety".
- 17 Lewis Akenji (2019): [Avoiding Consumer Scapegoatism : Towards a Political Economy of Sustainable Living](#). Helsinki University.
- 18 NREL (2006): [Regional Differences in the Price-Elasticity of Demand for Energy](#).
- 19 Already before the crisis, energy poverty was a widespread problem in the EU. 35 million Europeans were not able to afford sufficient thermal comfort, according Magdalinski, Emilie, Marie Delair, Thomas Pellerin-Carlin (2021): [Europe needs a political strategy to end energy poverty](#). Jacques Delors Institute Policy Paper #259.
- 20 [Europe's scramble for LNG leaves Asia starving for energy - E&E News \(eenews.net\) ; Russia's War Has Sparked A Coal Renaissance | OilPrice.com](#)
- 21 Page 18 in Lenaerts, K., S. Tagliapietra and G.B. Wolff (2021) 'Can climate change be tackled without ditching economic growth?', Working Paper 10/2021, Bruegel.
- 22 In a recent paper, Creutzig et al. demonstrate that 79 % of 306 analysed demand-side options have a positive effect on human wellbeing. Creutzig, F., et al. (2022). *Demand-side solutions to climate change mitigation consistent with high levels of well-being*. *Nature Climate Change*. 12, 36–46.
- 23 "Many solutions that reduce primary material and fossil energy demand, and thus reduce GHG emissions, provide better services to help achieve wellbeing for all." IPCC report, *Climate Change 2022: Mitigation of Climate Change*, chapter 5, p 107
- 24 Coal and oil can be more easily diversified as they are traded and shipped globally. Gas imports from Russia rely on pipeline infrastructure and supply via LNG is limited by global supply and demand.
- 25 Figures for 2020 by Eurostat are given by [bne Intellinews and Energy Information Administration](#)
- 26 Shares in 2019 according to [Agora Energiewende](#)
- 27 [IEA proposals](#), [Greenpeace proposals](#)
- 28 The message should be for example "lower room temperature to 19 degrees" or "put on a sweater in the winter" instead of "lower the room temperature by 1 degree".
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- 36 See above: for example replacing car travels with bike and public transport leads to lower air pollution and more physical activity. Both help to improve health quality.
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- 38 For instance, introducing a speed limit of 110km/h in FR, while in Germany only 130 km/h might be realistic. While in Northern Europe cooling in summer is negligible in energy demand, southern Member States might want to introduce ambitious measures to reduce energy demand for cooling.

- 39 IEA (2022): [Playing my part](#). Paris. 22. April 2022.
- 40 Hyland-Wood, B., Gardner, J., Leask, J. et al. [Toward effective government communication strategies in the era of COVID-19](#). *Humanit Soc Sci Commun* 8, 30 (2021).
- 41 McWilliams, B. and G. Zachmann (2022) 'The European Union demand response to high natural gas prices', *Bruegel Blog*, 8 April
- 42 This recommendation is based on evidence of advertising bans in changing social norms and behaviour as proven for smoking: [WHO/Europe | Tobacco - Banning Advertising, Sponsorship and Promotion](#)
- 43 Sport Utility Vehicle
- 44 While the three concepts/strategies are presented in this table as clearly separable from each other, the limits particularly between efficiency and sufficiency are often blurred.
- 45 Consistency describes the transition to technologies consistent with the environment. This means changing towards a circular economy using renewable energy sources.
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Institut Jacques Delors

Penser l'Europe • Thinking Europe • Europa Denken
18 rue de Londres 75009 Paris, France • www.delorsinstitute.eu
T +33 (0)1 44 58 97 97 • info@delorsinstitute.eu

