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FROM THE ENERGY CRISIS TO (RE)IMAGINING THE ENERGY TRANSITION

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How the energy crisis is framed

On the website of the European Council, the headline reads: "Europe is experiencing an unprecedented energy crisis. EU countries are working together to address high prices and secure energy supplies for Europeans."[1] Next, the main goals of the EU's response to the energy crisis are defined as: "ensure affordable and competitive energy for EU consumers; increase the EU's energy security and preparedness in the event of emergencies; strengthen the energy resilience and autonomy of EU countries."[2]

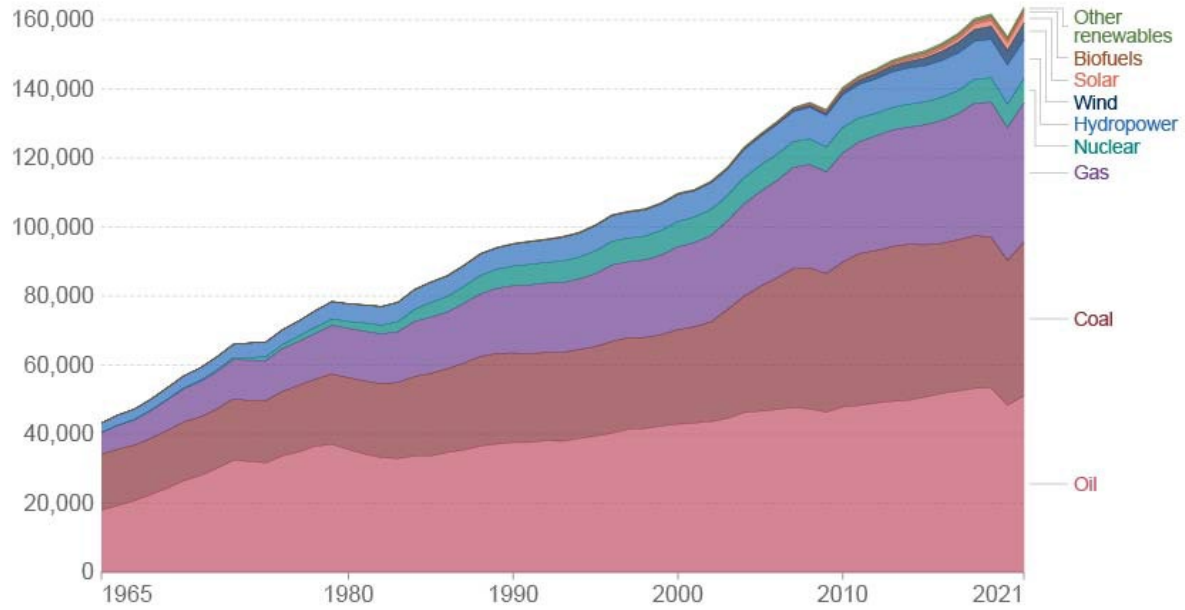
This illustrates well how the EU predominantly frames the energy crisis: on the one hand in terms of energy supply security and on the other hand in terms of energy affordability. As Russia is blamed for the energy crisis[3], attention is largely turned away from the connection between the energy crisis and other crises such as the climate crisis. The political answer focuses in the first instance on diversification of gas supply, keeping energy prices under control and trying to accelerate renewable energy production in order to reduce dependency on energy imports. Reduction of demand is also part of the package, but these measures are non-binding, and address citizens and businesses at an individual level, with suggestions as turning down heating, adjusting boiler settings or reducing speed on the highway.

Why do we think this is problematic, not only to address the energy crisis, but also when looking for an answer that takes into account the climate crisis?

Energy demand is (too) high and increasing

An important step is recognising that current global energy consumption, for almost 85% based on fossil fuels, is already too high for remaining within the 1,5°C climate target of the Paris Agreement, without hoping for massive negative emissions[4] (by investing in technologies such as CCUS that have not yet proven their effectiveness at scale, and have a risk of further carbon lock-in). Global energy demand is rising – recently reaching its highest level in history[5] - and is further projected to rise over the coming decades. To give a telling example: global energy demand for cooling in 'emerging and developing' economies in 2050 alone is expected to be as much as today's overall energy demand by the European Union.[6] Under the current energy system, fast rising demand increases emissions and contributes directly to climate change and other environmental problems (such as soil and air pollution). Meanwhile, fast increasing demand also raises energy prices.[7]

Figure 1: World absolute energy consumption by source[8]



The policy answers to this situation take two main directions: a swift and massive shift from fossil fuels to renewables, and keeping control over energy demand by investing in efficiency measures. Both are obviously crucial, but they also have some important limits. Without a central role for demand reduction, deep decarbonisation is impossible. Demand-side solutions are useful in the Global North as well as in the Global South[9], but given the major inequalities between North and South, the abandonment of high-carbon lifestyles in the North, as a collective societal ambition, is of high priority (while simultaneously taking into account the inequal distribution within e.g. the EU as well).

Let us first have a brief look at the limits of current policy directions. A massive shift to renewables is essential, and indeed, the share of renewable energy in total energy consumption is increasing, but slowly and insufficiently fast to reach e.g. the IEA's Net Zero Emissions by 2050 Scenario.[10] To do so, the share of renewable energy would have to increase at a speed twice as fast as it increased over the previous year.[11] In the light of predicted growth in global energy demand over the coming decades, renewable energy should at least cover this growth. In the years where renewable energy covered the growth in electricity demand (2019; 2020) this was, however, "largely due to exceptionally slow or declining demand, suggesting that renewables outpacing the rest of the electricity sector is not yet the new normal."[12] Moreover, research into the history of the energy system over the last 200 years shows that new energy sources (coal, oil, gas, nuclear) have always added to total energy use, instead of substituting one source for another. The contribution of modern renewables "has thus far primarily added to the total energy supply, rather than providing any absolute displacement of fossil fuels."[13] Without a dramatic change in this trend, reaching 2050 climate goals becomes impossible.

What about energy efficiency? Again, it is obvious that energy demand for e.g. housing, transport, production processes or food provisioning should be met through efficient technologies and services. But also, energy research has proven convincingly that a sole focus on efficiency has potential pitfalls. First, since the industrial revolution energy efficiency has served to boost productivity and growth[14], and unfortunately, economic growth is a main driver of greenhouse gas emissions, as the latest IPCC report observes once more.[15] Second, when some energy demands are

met more efficiently, costs are reduced, which provides people and businesses to buy more and/or new products and services, in that way undercutting potential efficiency gains. This so-called rebound effect might thus even increase total energy use.[16]

This brings us to the conclusion we formulated a few paragraphs earlier: reversing the global trend in emissions necessitates reducing global energy consumption. This implies severely scaling down energy demand in the Global North, so that e.g. the EU can develop towards its fair share of the remaining global carbon budget. Upscaling renewable supply and efficiency is necessary but reducing energy demand should take centre stage. The current energy crisis presents an opportunity to engage with this process. However, so far, the crisis has been framed in terms that poorly allow for, and even stand in the way of, such an energy transition.

From energy crisis to (re)imagining the energy transition

Before we try to sketch a framework for the necessary energy transition, we return for a moment to the current framing of the energy crisis. The crisis exposes the fragility, unsustainability and untenability of the current energy system.[17] A broader understanding of the energy crisis and a larger perspective on energy questions are needed.

First, attributing high energy prices entirely to Russia's invasion in Ukraine is incorrect. This framing deflects blame and criticism away from our own energy model and separates energy from the larger context in which it operates, including climate change and the energy transition. The current energy crisis might be triggered by the Russian-Ukrainian war, the deeper causes are to be found in an unduly liberalized and globalized fossil-fuel based energy market. Re(imagining) our energy system to prevent future crises demands recognising and considering the embeddedness of energy in issues of climate change, and global distribution and justice.

Second, in order to secure energy supply, governments increased oil- and coal-fired (particularly in Europe) electricity generation[18], extended the lifetimes of nuclear power plants (Belgium and Germany), and searched for additional gas storage[19] - all short-term measures tackling the symptoms instead of the disease itself. Curing energy supply disruptions makes more sense by reducing the amount of energy to be supplied (reducing energy demand) than by just shifting suppliers. Moreover, these measures contribute to worsening climate change and hinder moving towards a sustainable energy system.

Third, the focus on keeping energy affordable for households is of course necessary – as the crisis exacerbates energy poverty and food insecurity, especially among the least well-off in both the Global North and the Global South[20] – but its current interpretation isn't contributing to a more sustainable energy model. Seeking to lower energy prices, the EU mandated its member states to reduce overall energy demand through a 'REPowerEU' and a 'Safe Gas for a Safe Winter' plan. In previous paragraphs, we explained why reducing the energy demand is key to the energy transition. However, there are different ways to reduce energy demand. Seeking to do so from the framework of securing energy supply and energy affordability – the EU's plans seek a reduction of energy demand through reduced energy consumption during peak hours[21] and through efficiency measures – fails to fully acknowledge the role of reduced energy demand in the energy transition, limits its impacts on mitigating climate change, and neglects important questions of justice. Besides, the current appeal to reducing energy demand tastes somewhat bitter: what could not be demanded as a measure in tackling the climate crisis, is now portrayed as part of the solution to the energy crisis. Once the energy crisis is over and prices lower, will people keep their energy demand reduced? High energy prices predominantly hit the least well-off, forcing them to refrain from basic needs such as heating and cooking. Do we find reducing energy demand in these situations desirable? How and when do we – as society – can and want to reduce energy consumption in light of the energy transition? The

next section provides at least some starting points for thinking about this.

Concepts for moving towards a fair energy system within environmental limits

The academic literature on climate change and its societal consequences has been booming for years. Concepts are emerging that can guide policies along a double track: quickly and deeply cutting emissions in order to bring a future energy system within environmental limits, while simultaneously ensuring a just distribution of the efforts and of the available environmental space. This justice aspect is, by the way, not only a moral argument, but is also political and pragmatic, in the sense that the deep societal changes that are ahead of us, will not be acceptable for populations worldwide (and nationally) without a fair process and results.

As far as we can see, all of these emerging concepts and frameworks take demand reduction and the idea of sufficiency as central elements. We briefly present several interconnected concepts that can inspire future fair low-carbon policies. These include Decent Living Standards (DLS), energy sufficiency, energy justice, 1,5°C lifestyles and sustainable consumption corridors. It is an important step that several of these concepts have also been picked up in a new chapter in the last IPCC AR6 report on mitigation. Although in the past, the IPCC already paid some attention to demand and sufficiency, technology supply-side solutions have always been central. The new chapter on demand, services and social aspects of mitigation highlights recent research from the social sciences and considerably broadens the scope of possible approaches.

One of the central concepts is the idea of Decent Living Standards (DLS). A DLS is a set of minimal material requirements essential for achieving basic human well-being, which includes needs such as adequate nutrition, shelter, basic living conditions, clothing, healthcare, education, and mobility.[22] These needs can be met in different ways, depending on local contexts, cultures, geography, available technologies, social preferences, and other factors. Meeting these needs in a low-carbon way will have to become a top priority in the future. This will require a double movement. On the one hand, countries and populations below DLS levels will have to scale up, while relying on low-carbon services. Countries and populations with consumption far above DLS levels will have to scale down, while meeting needs in a low-carbon collective and individual lifestyle. This has been formulated as a search for "sustainable consumption corridors,"[23] where an establishment of minimum and maximum standards of consumption creates the opportunity to remain collectively within environmental limits, while simultaneously reducing inequality.

Policy would thus build on energy sufficiency, i.e. providing everyone with sufficient energy to fulfil needs without causing social and environmental harm. Energy sufficiency relates to the relationship between energy consumption and well-being. Contrary to what is often assumed, the relationship between energy consumption and well-being is not linear. Increased energy consumption is associated with improved well-being and higher living standards only to a certain point, after which increased energy consumption no longer improves living standards and even adversely affects well-being.[24] Many in the Global North have reached this threshold, and many have transgressed it. Maintaining a level of sufficiency would consequently increase well-being.

One of the conclusions of the IPCC report therefore reads that "there is *high evidence* and *high agreement* in the literature that through equitable distribution, well-being for all can be assured at the lowest-possible energy consumption levels (…) by reducing emissions related to consumption as much as possible, while assuring DLS for everyone" (italics in the original).[25] It is essential to see that this implies policies that go way beyond targeting individual behaviour change. It supposes a society-wide collective endeavour where investments in e.g. infrastructure and universal basic services provide the backbone within which social practices and individual behaviour can change.

The concepts we presented can be used internationally but also at EU level or nationally. For the

EU, the biggest potential for developing collective 1,5°C lifestyles lies in the areas of food (reducing animal-based products and food waste), housing (heating, cooling, equipment, living area) and mobility (car possession, flights). Equity and redistribution will be key, because also within the EU (energy) consumption diverges enormously between regions and between individuals. In a revealing study, Oxfam found that in the 25 years between 1990 and 2015, in which the EU's consumption emissions fell by around 12%, the richest 10% of EU citizens were responsible for over a quarter (27%) of these EU emissions, the same amount as the poorest half of the EU population combined. Most remarkable is that the total annual consumption emissions of the poorest 50% of EU citizens fell by 24%, and those of the 40% of EU citizens with 'middle incomes' by 13%, while the emissions of the richest 10% grew by 3%, and of the richest 1% by 5%.[26] This is obviously untenable in the future.

Final remarks

Recent studies show that together, energy efficiency and energy sufficiency could lower global energy consumptions in 2050 to 60% of today's energy use.[27] In energy-intensive countries, approximately 95% of energy consumption can be avoided while respecting a decent living to all[28], as high standards of living can be achieved with relatively low levels of energy consumption.[29]

Reducing energy demand in the context of the energy transition does not have to constitute a concern and a burden as experienced by many people in the context of the energy crisis. Rather, it bears the potential of improving quality of life, well-being and social and environmental justice.[30] Not only is lowering energy consumption through energy efficiency and energy sufficiency the fastest, cheapest, most reliant and most flexible way of mitigating climate change, but it is also a more just pathway than other (pathways to) 'sustainable' futures[31], notwithstanding the complementarity of renewable energy. The latest IPCC report, with its overview of recent social science insights, provides us with a set of concepts to guide that transition.

The current energy crisis presents an opportunity to (re)imagine the energy transition, as being about lowering global energy demand, and rethink our energy system, as being based on the principles of energy efficiency and energy sufficiency, as such enabling universal access and affordability of energy. However, current framings of the energy crisis make little of the opportunity, and the focus on securing (fossil) energy supply in the Global North threatens the transition towards a more sustainable, climate-aligned and just energy model.

The need for energy consumption reductions in the Global North is often dismissed from un-substantiated trust in future Carbon Dioxide Removal (CDR) technologies, and illusory optimism in the speed and scale of renewable energy deployment. Not only is this gambling with human lives and our planet, as it rests on good faith in dubious, dangerous and controversial technologies that do not even exist or are deployed today, but it also refutes moving towards more prosperous (in terms of well-being) and just societies.

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