

Empowering Communities, beyond Energy Scarcity [†]

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“If we talk of promoting development, what have we in mind: goods or people?” [1]

1. A Collaborative Network of Scientists and Social Communities

Since the year 1998, a series of Advances in Energy Studies Workshops (BIWAES) have aimed to sharpen scientific focus and build a critical mass and collaborative network among scientists and social communities researching energy and energy-related wellbeing. The workshop was hosted by different countries (Italy, Brazil, Spain, Austria, India, Sweden). The 2008 workshop (Towards a Holistic Approach Based on Science and Humanity) was held in Graz, Austria [2]. The 2021 BIWAES occurred in Graz, as a Special Session of the ERSCP2021, European Roundtable on Sustainable Consumption and Production [3].

This workshop aimed to gather all potential players in the energy field, to share knowledge and practices, regulations and roadmaps, as well as integrating and promoting different ways of looking at energy solutions. If successful, this pattern may finally help society to move beyond fossil fuels, overcome energy scarcity and environmental degradation, and prevent the exclusion of important sources of understanding and knowledge.

2. Interdisciplinary Evaluations

The energy problem cannot be addressed using only thermodynamic or technological terms. As was shown in previous editions of BIWAES, a deeper understanding of trends, solutions and policies can only be achieved by converging the efforts of different disciplinary sectors, so that economic, social, environmental, cultural and psychological expertise can converge into an innovative picture of local and larger communities, towards a shared well-being.

3. Old and New Consumers

After COP 21 in Paris [4], the promotion of international agreements on climate change and societal attention to the sustainable use of energy and resources continued to increase. Energy and environmental security are major problems facing our global economy. The increased growth, although this was recently slowed down by the Covid pandemic, and the demands for welfare and well-being made by developed and developing countries, have placed increased pressure on energy resources. A large fraction of “new consumers” in developing countries, mainly concentrated in megacities, strive to access commodity and energy markets worldwide, thus boosting energy consumption and competition for all kinds of resources.



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4. Energy Planning

Fossil fuels contributed heavily to climate change and planetary instability. Their supply is governed by dynamic political, economic and ecological factors, independently of the sometimes-questioned estimates about the remaining storage. However, renewable energies are not exempt from environmental and management problems, which make their use questionable, and they are not yet available everywhere. Not all energies have the same quality and environmental costs. They also differ in their extraction, processing, use, turnover time, and land and water demands. This means that energy planning is a challenge, which reaches beyond the achieved or achievable technological progress. We cannot disregard the fact that all energy sources (both renewable or nonrenewable) have pros and cons; their use affects the environment and quality of life to different but non-negligible extents.

However, energy is a fundamental resource for societal and economic metabolisms; not only do we need energy, but we clearly need to address crucial questions regarding its use (energy to do what? energy from where?) and appropriate management (top-down vs. bottom-up energy policy-making).

5. A New Energy Scarcity

As is well known, a new kind of energy scarcity is occurring, not only due to its limited abundance, but due to environmental constraints and trade-offs, its unequal availability worldwide and the market prices. The latter also affects the spread of renewables and energy-efficiency efforts and programs. The achievement of sustainable economies and shared well-being calls for an urgent re-framing of the energy problem towards a balanced mix of different solutions, including technological improvements, a use of energy resources that is consistent with their thermodynamic properties, a selection of environmentally friendly sources and carriers, suitable approaches to monitoring the impacts, efficiency measures with rebound control, lifestyle equity and reductions in energy poverty, decrease in wasteful habits, recognition of environmental limits in a limited planet, and careful management of the energy–water–food–environment nexus. A deeper understanding of these crucial aspects, including ways to address them in our production and consumption patterns, may help us develop qualitative growth and sustainable lifestyles, beyond the illusion of unlimited energy availability and technological fixes.

6. Empowering Communities

Who is in charge of energy solutions? Scientists and technology experts have provided important contributions within research, business and policy-making frameworks. However, some top-down solutions have not always shown an ability to fully address the needs of communities, nor have they promoted stakeholders' and citizens' participation in tailored solutions for different situations. It may be time to integrate top-down and bottom-up efforts, in order to benefit from community insight and knowledge (from regional, urban, neighborhood and condominium realities, rural organizations, and developing communities worldwide), and find needs and solutions that are visible to local realities and not easily visible to experts and policy-makers.

7. Well-Being

Well-being, at the level of local or larger-scale communities, is not only linked to decreasing fossil energy use and energy scarcity. Instead, well-being is deeply linked to lifestyles, community services, fair relations among ages, social levels, professional categories, and stakeholders, towards the satisfaction of primary needs (access to food, decent housing, suitable mobility, and an appropriate and rewarding job), as well as lifestyles that offer each individual access to quality growth, such as culture, social relations, leisure, recognition, and empowerment. Although we cannot claim that energy is the solution to all world problems, we are well aware that energy is one of the most important developmental drivers. Too many countries suffer from energy poverty, due to insufficient, inadequate,

expensive or unequal energy supply. There is energy behind the water supply, food production, urban and extra-urban mobility, housing, health, education, communication, democracy and, ultimately, well-being [5].

Awareness of the planetary limits calls for equity policies based on resource-sharing, education, understanding, happiness, and peace. A radical change in the business-as-usual paradigm is needed to allow for people to develop within the Earth's biophysical limits. The further that business-as-usual is allowed to go, the more difficult it will be to reverse this process.

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