



## Social Benefits of Renewable Energies

### Creating the Environment for Societal Ownership – Lessons learned from Germany's Energiewende



Boosted by impressive technological innovation and cost reductions, renewable energy in a growing number of countries is now primarily considered for its social and economic benefits. Among these benefits are opportunities for local value creation, for responding to growing energy demands and for reducing conflicts over scarce water, which are aggravated by fossil power generation. Allowing for distributed electricity generation, the rapidly expanding renewable energy world is opening up business models for many, including local communities, citizens and citizens' cooperatives. Domestic energy policy can shape the enabling environment to seizing the social benefits of renewable energy.

#### Renewable Energies – A Multi-benefit Opportunity

Rapid technological innovation and substantial cost reduction, particularly for photovoltaic (PV) systems and wind power over recent years are opening up new economic, social and ecological opportunities. The development of renewable energy as a true multi-benefit system has also been indicated by the Intergovernmental Panel on Climate Change (IPCC) in its most recent assessment report on numerous occasions (for an analysis see Jänicke et al. 2015).

The costs for solar PV panels have dropped by an impressive 75% in less than 10 years. For wind power the cost decrease already started earlier, making it the cheapest renewable energy source in many regions, with costs



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continuing to drop. As a result, fossil energy sources are losing their cost advantage over solar and wind, making renewable energy the cheapest source for electricity generation in an increasing number of countries worldwide. Even without accounting for the considerable external long-term costs of climate change and environmental degradation.

The old energy world, dominated by conventional power plants and based on fossil energy sources (coal, lignite, gas and oil) or nuclear, is characterized by large-scale projects with substantial planning horizons, not least regarding meeting security standards in nuclear power generation. In the emerging new energy world, renewable energy production is characterized by distributed power generation and smaller-scale projects with typically much shorter planning horizons, which allows for quicker responses to growing energy demands in many countries.

In Germany, as well as in other countries, renewable energy innovations have opened up an entirely new job sector based on technology development, production, installation and maintenance (IRENA 2015). Also in this regard, distributed power generation, through smaller-scale projects, is closely connected to a regionally distributed economic value creation and job sector development. An additional aspect of local value creation is linked to the emergence of citizens as renewable energy producers and energy providers. An estimated 47% of the overall installed renewable energy capacity in Germany as of 2013 — adding up to an installed capacity of 33.5 GW — is in the hand of citizens, mainly through privately owned solar rooftop systems and citizens' wind farm cooperatives. Those projects provide approximately 1.6 million Germans with additional income or reduced spending for external electricity.

In the face of increasing resource conflicts over water, the high water demand of fossil and nuclear power generation for essential cooling systems are a severe threat to sustainable and secure power generation. Against this background, particularly solar PV and wind power offer water-saving electricity supply and reduce local water stress. Given the projected climate change impacts on an increasing number of vulnerable regions, this social benefit of renewable energy might even become more important in the decades to come.

### **Creating the Environment for Societal Ownership**

Citizens, local businesses and bottom-up initiatives for local renewable energy production have been true game changers in the domestic energy sectors of countries including Germany and Denmark. In contrast to established energy companies and their prevailing business models, these new players were much quicker to make use of the emerging economic opportunities presented by renewable energy. As a result, renewable energies in these countries enjoy a broad financial ownership, which not only drives the Renewable Energy market but also distributes economic returns across society.

What made these new players appear and motivated their strong commitment, leading to disruptive changes in the energy market? The foundation for this transformative shift has been progressively building up in Germany since the 1970s and has recently be catalyzed by rapid innovation and cost reductions in renewable

energy technology which resulted in many new players entering and shaping the energy market.

Efforts for reducing dependence for fossil fuel imports in face of the 1970s oil crises, resistance against hazardous nuclear power (starting in 1970/80s), a broad movement towards sustainability and to combatting climate change (starting in 1980/90s) provided a firm readiness and support for an energy system transformation in Germany. Building on these three complementing phases of the German Energiewende, the Renewable Energy Act (2000) translated the societal impetus into legislation, creating the environment for a broad financial ownership of Renewable Energy in society. In this forth phase of the Energiewende, also emerging and reflected in other countries, a number of enabling factors were put in place, sparking rapid innovation and cost reductions in renewable energy technology and an impressive growth of renewable energy capacity, both in Germany and internationally. Creating investment security, developing financing routines and building trust with respect to renewable energy were among the key factors of recently fostering this transformative environment.

With its Renewable Energy Act in the year 2000, Germany opened up the electricity market and created investment security and business opportunity for many through two main facilitating factors; first, it assured that Independent Power Producers (IPP) would be able to sell all their generated electricity to the market by guaranteeing grid access and granting grid priority for these new producers. Second, the combination with fixed Feed-in tariffs for power produced, guaranteed for 20 years, made the return of investment calculable and reliable. This, in turn, also motivated financial institutes to provide IPP with loans to start their businesses. Long-term national targets for renewable energy capacity also sent important signals about the scope of this new sector and its expected growth.

In 2016, providing loans for solar PV rooftop facilities and other renewable energy projects have become routine for German banks, based on the investment security granted. These financing models and routines, however, certainly did not emerge overnight. Furthermore, they are closely connected to the specific characteristics of the national banking sector and require active learning processes on the side of the financial institutes and on the side of the IPP as client. Trust building with respect to renewable energy not only as a reliable energy source, but as a business model is a key component in this process of developing financing routines. A strong political backing of this process through the creation of investment security and support for small businesses and private households as IPP and key players of renewable energy deployment can contribute to trust building.

### **Seizing the Social Benefits of Renewable Energy**

Renewable energy has emerged as a true multi-benefit system, combining ecological necessities like climate change mitigation with society's visions and economic opportunities. Local value creation based on technology development, production, installation and maintenance, increasing energy access in a timely manner, reducing resource conflicts in a water-constrained world and improving air quality for a healthy environment are among these opportunities.

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## IASS BLOG

An increasing number of countries are showing awareness of these multiple opportunities and are amending their national energy policies to reflect social benefits by actively pursuing and shaping the new energy world based on renewable energy.

This text is based on a conference talk and contribution for Egyptian German Science Monitor: "Re-Thinking Energy: Scientific Input – Social Output"

*Header image: Energiegenossenschaft Starkenburg*

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