

## Policy Framework to Achieve 100% Renewable Energy

*By Hans-Josef Fell*

### 1. 100% renewable energy worldwide is feasible and cost-efficient

A global energy transition to 100% renewable electricity is no longer a question of technical feasibility or economic viability, but of political will, a new study by the Energy Watch Group (EWG) and Lappeenranta University of Technology (LUT) has proved.

The study “Global Energy System based on 100% Renewable Energy – Power Sector”<sup>1</sup> published in November 2017 ultimately refutes a frequently used argument by critics, having proved that a global electricity system fully based on renewable energy is feasible at every hour throughout the year and is more cost effective than the existing system, which is largely based on fossil fuels and nuclear energy.

According to the study, a total levelised cost of electricity (LCOE) on a global average for 100% renewable electricity in 2050 would be €52/MWh (including curtailment, storage and some grid costs), compared to €70/MWh in 2015. A transition to 100% renewables would bring greenhouse gas emissions in the electricity sector down to ZERO and drastically reduce total losses in power generation. It would create 36 million jobs by 2050, 17 million more than in today’s energy system.

### 2. Favorable policy framework is decisive to achieve 100% Renewables

In order to achieve a global transition to 100% renewable energy, the global community must significantly accelerate the process by adopting and implementing favourable political frameworks and measures. The following list presents the key policy measures required for a swift transition.

#### 2.1. Adopting climate protection in national constitutions

The dramatic increase of world temperature is one of the most serious and urgent threats to humanity and human lives. As a political outcome of the Paris Agreement targets, climate protection must be adopted as a national target in constitutions worldwide.

#### 2.2. Setting the political target for 100% Renewables by 2030

Policy makers on national as well as on the district and local levels have put forward the bold goal of switching the full energy supply to 100% renewable energy. All nations worldwide should follow the example of the Climate Vulnerable Forum – a coalition of 48 countries, most

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<sup>1</sup> EWG 2017

vulnerable to climate change. These countries have set a target and agreed on a transition plan on 100% renewable energy by latest 2050.

Communities and cities around the world need to contribute towards 100% renewables like hundreds of cities, which already did, including Vancouver, San Francisco, Munich, Frankfurt, Barcelona, Geneva, Doha and Sydney.

The willingness of the public to switch to 100% renewable energy is the first decisive step. The second step is a clear legislative framework to promote fast and steady growth of renewables.

Two strategies are key to achieve such transition: on the one hand support for a fast growth of renewables is needed and on the other hand restrictions for all fossil- and nuclear corporations should be introduced.

To achieve a successful policy implementation with the goal to run on 100% renewable energy, national legislative acts are needed. Those have to be meticulously assessed, ensuring a high certainty in promoting the expansion of renewable energies.

The following policy measures and instruments have already proved to ensure a sufficient flow of private investments to renewable energy. Public funding is helpful and important but it should be complemented and topped by private investment since the transition towards renewable energy is a cost intensive matter. The required capital for a successful energy transition exceeds the potential of public budgets. The following measures describe the importance of each economically supporting tool.

### **3. Instruments, enabling direct private investments in renewable energy and other zero-emission technologies**

**3.1. The German Renewable Energy Sources Act (EEG)** is the prime example for a successful policy framework. It contributed largely to dramatic cost decreases for initially cost intensive technologies. Due to continuous cost reduction over the past years, wind and solar power have become mainstream renewable energy sources worldwide. The EEG with its feed-in-tariff and guarantees for renewables has proven itself a valuable tool.

Key points for an effective Renewable Energy Act (Feed-in Law):

- Privileged grid access for renewable energy sources
- Feed-in-tariff has to be appropriate for economic operation, with variations depending on technology and size
- Funding of feed-in tariff via electricity rate
- No cap for feed-in of renewable energies
- Degression of feed-in tariff with cost reduction of renewable technology investment
- Guaranteed period of remuneration

Recently a range of countries have drafted and adopted legal acts on renewable energy auctions and tendering. But a recent comprehensive policy brief<sup>2</sup> by Hans-Josef Fell and the Energy

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<sup>2</sup> Fell 2017

Watch Group for the International Renewable Energy Agency (IRENA) has shown that tendering procedures hinder the growth of renewables and result in higher prices for customers. Furthermore, tendering procedures limit investments to large companies and exclude investment from decentralized actors, such as cooperatives. Tendering procedures should therefore only apply for capacities above 40MW, whereas remuneration by fixed feed in tariffs must be available for all projects with an installed capacity below 40MW.

We also need new innovative political measures, advancing with the tasks ahead, such as investments in network integration, interconnecting sectors and compensating fluctuations in wind and solar energy. A reformed version of a feed-in-tariff law offers precisely this: **hybrid renewable power plant remuneration**.<sup>3</sup> Such remuneration by fixed feed in tariffs would cover the plants with different mixes of renewable energy technologies and would ensure the grid stability during the solar and wind energy fluctuations.

### **3.2. Removal of all state subsidies regarding energy generation with CO<sub>2</sub>- and radioactivity emission**

Accelerating the growth of renewable energies requires the abolishment of all subsidies for conventional fossil and nuclear energy plants and infrastructure. This includes especially subsidies for coal powered energy plants and new natural gas pipelines. Tax exemptions for fossil fueled power plants and fossil fuel use need to be ceased too.

### **3.3. Tax exemptions for investments in renewable energies**

While tax exemptions for fossil and nuclear energy use need to be removed, tax exemptions for renewable energy sources need to be introduced. Companies and investors who contribute to making renewable energy technologies more efficient should be awarded with the incentive to receive tax exemptions. Companies who trade renewable energy should also receive these incentives to provide them with appeals to invest more money in renewables, which in the end maximizes the overall return on investment.

### **3.4. Pollution (CO<sub>2</sub> and Radioactivity) Tax**

The general idea behind the pollution tax is to sanction energy companies which rely on fossil fuel and nuclear as generating resource, impairing the economic sector of the fossil/nuclear fuel economy. A sufficient pollution tax is able to promote renewable energy only if the prices for fossil/nuclear energy plus the tax exceed the average price in comparison to renewable energy prices. It does not promote renewable energy measure unlike the feed-in-tariff law but can, to a certain extent, impair conditions for fossil fuel energy plants with high emission levels. A pollution tax should therefore be closely connected with fluctuating energy prices and needs to be assessed meticulously.

### **3.5. Replacement of emission trading system with carbon and radioactivity taxes**

The emission trading system did not prove to be an effective economic instrument in fighting climate change. Trade certificates are as a rule influenced by different factors on the economic market. It could occur that the prices for these certificates are decreasing to the extent that emission certificates would not perform the desired result in preserving climate conditions.

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<sup>3</sup> Fell 2016

Therefore the emission trading system is insufficient and should be disestablished, whereas a continuously rising CO2 tax needs to be implemented.

### **3.6. Promoting research and education in the sphere of renewable energy and zero-emission technologies**

National support for research and science on renewable energy and clean technology is vital. The national budgets for research and education on renewables must be increased significantly, while financial support for fossil and nuclear development needs to be ceased. This would highly increase the share of financial means for renewables. The financial support for development and deployment should include technical development, analysis of the economical possibilities, the impact of renewable technologies, social and cultural consequences as well as its impact on gender and acceptance.

Education as well as vocational training on all educational levels (kindergarden, schools, universities, further education) needs to be significantly improved. This is not only applicable in the technical field but also for economical tasks and accompanied framework programs. Awareness programs for the broad society on the dangers of climate change and the role of renewable energies as the most important solution need to be implemented.

### **3.7. Facilitation of authorization**

Authorities and lawmakers must give assistance in authorization of construction sites to build renewable energy power plants and other renewable investment. This includes the required infrastructure such as storage and grid connection.

These legal regulations must serve the cause to protect residents from greenhouse gas emissions and other dangers to health (noise, fumes from biogas, and others) as well as fulfill ecologic and social standards. Waste disposal, reduction of emissions, technical norms and local environmental protection should be considered too.

Protection of landscape, local bird and fish population need to be achieved through technical requirements and must not hinder investments in renewable energy.

### **List of References**

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