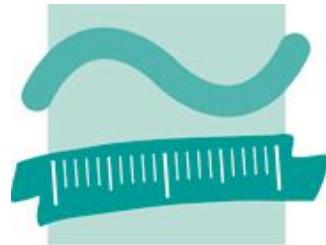


# **Beuth University of Applied Sciences Berlin**

Department VIII:  
Mechanical Engineering, Event Engineering, Process Engineering

B.Eng. Mechanical Engineering - Design



BEUTH HOCHSCHULE  
FÜR TECHNIK  
BERLIN

University of Applied Sciences

## **The Future of Energy**

# Energy Transition – Of Direct Subsidies and Clever Ways of Support

Author: Julian Philipp Musiol

Matriculation Number: 765043

Email: julian\_musiol@yahoo.de

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# 1 Introduction

## 1.1 Motivation

This short paper has the purpose to open the reader's eyes for a new approach to financing the *energy transmission*. This approach releases massive amounts of money without governments having to pay a cent. It is a way of supporting<sup>1</sup> renewables with no favoritism.

## 1.2 What is Energy Transition

Energy transition is a term commonly used to describe the desire to change the energy mix<sup>2</sup> of a county or an association of countries from conventional energy sources towards renewables.

Renewables are defined as “[...] *any energy resource that is naturally regenerated over a short time scale and derived either directly from the sun (i.e. thermal, photochemical, and photoelectric), indirectly from the sun (i.e. wind, hydropower, and photosynthetic energy stored in biomass), or from other natural movements and mechanisms of the environment (i.e. geothermal and tidal energy). Renewable energy does not include energy resources derived from fossil fuels, waste products from fossil sources, or waste products from inorganic sources.*” [1]

Besides reducing emissions of greenhouse gases, which can heat the planet, and therefore benefiting the environment, a shift towards renewable energy sources means a step towards energetic autarchy. Countries with limited access to coal, gas or oil are able to take a step towards energetic self-sufficiency without relying on debatable technologies like nuclear power.

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<sup>1</sup> Not subsidizing

<sup>2</sup> Energy mix defines as “the range of energy sources of a region, either renewable or non-renewable” [11]

### 1.3 Europe's Energy Transition

For the purpose of this paper, let us take a look at current results of those efforts:

The European department for statistics announced that the portion of renewables in the energy mix has risen from 8.1% in 2001 to 13% in 2011 [2]. In 2011, Norway is leading the list with 64.7% of their energy drawn from renewable sources. With 46.8%, Sweden is the best representative for renewables in the European Union. Germany has 12.3% of its energy drawn from renewables, which is about EU average. According to the department for statistics, the German target value for 2020 is 18%. The target value for the EU is 20%. [3]

The following paragraphs will give you an insight of how a country like Germany promotes renewables and tries to reach its energy transition goals. Other countries are not taken into account.

### 1.4 Current German Subventional Measures

#### 1.4.1 Measures

To promote renewable energies, the German government passed the Renewable Energy Law (EEG). Main content of the EEG is to prioritize the charging of renewable energy into the distribution network over the charging of conventional energy. In addition, there is a compensation for renewable energy fed into the grid. The EEG differentiates between different sources of renewable energy. In this way, a kWh of hydro energy is subsidized differently than a kWh of photovoltaic energy. [4]

#### 1.4.2 ..., their Benefactor

As is the nature of a subsidy, someone has to pay for it. The EEG directs the distribution of subsidies as well as the gathering of the aid money. The principle is simple. Every consumer of electricity, no matter if they are private or commercial, has to pay a share. The so called EEG-allocation is a fixed amount of money a consumer of electricity has to pay for each kWh used. In 2012 the EEG-allocation added up to 5.3 cents/kWh.

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Unfortunately certain businesses with a high energy demand are excluded from the allocation. Thus the amount that private consumers and other businesses have to pay increases. [5]

### 1.4.3 ...and the Effects

The direct subsidy of renewable energies has had and currently still has a severe side effect. Technologies are excluded from the real market and thus face less competition. Technological progress is decelerated. The example of German solar industry shows how subsidies weakened the competitive position until being overrun by Chinese competitors<sup>3</sup> [6].

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<sup>3</sup> Due to subsidies, German solar industry failed to keep up with international production cost and was then overrun by Chinese competitors.

## 2 The Key to an Accelerated Energy Transition

The following paragraphs will describe a different approach of supporting the energy transition. It has several advantages and should be taken into account.

### 2.1 The Current Way of Financing Renewable Energy Infrastructure Projects

Because of the current way of financing, renewable energy infrastructure projects are fewer and smaller than they could be. Most projects are largely financed with loans. Facing large interest rates<sup>4</sup>, modern renewable power plants or parks need subsidies to be profitable.

What if there is a way of reducing the need for credits and thus making renewables a more competitive investment without direct subsidies?

### 2.2 The new approach: Equity Financing

In his 2013 book, *Showdown*, Dirk Müller describes a scenario in which rather simple additions to energy laws have a massive effect on investments in renewables. The following paragraphs shall explain and summarize the logic and the backgrounds of the scenario.

#### 2.2.1 Savings Accounts, Pension Funds and Life Insurances

There is one place where huge amounts of capital are available. It is savings accounts, pension funds and life insurances. The principle of all aforementioned is having a bank (or insurance<sup>5</sup>) manage equities of investors for a long time with the prospect of paying them back more afterwards.

To give a clue about the quantities we are talking, here are some figures: In 2007 every German adult had pension entitlements with the average amount of 67k €. That is a total of 4.6 trillion € [7].

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<sup>4</sup> Current calculated interest rates are 5-9% p.a. [8, p. 224]

<sup>5</sup> In the following, the mentioning of banks is meaning banks and insurances.

All of the savings in pension funds and the amount of savings in savings accounts are ready to be invested. Now here is the catch: Assets in pension funds and savings accounts<sup>6</sup> can of course only be invested complying with different kinds of laws. For our purpose *Basel II* (and soon *Basel III*) represents the most important obstacle. [8, p. 217]

Simply said, both *Basel II* and *Basel III* are a collection of financial laws. Their purpose is to regulate the equity ratio a bank has to provide when investing their customers' money. The idea is that a bank has to invest a portion of its own money. The more risk an investment brings along, the higher the percentage of own assets a bank has to invest. Therefore the amount which can be invested in *risky* investments is limited by the banks own assets. [9] [10]

Virtually *Basel II* and *Basel III* mean that banks can only invest a small amount of the assets they administer in infrastructure projects<sup>7</sup>. Large amounts of the administered assets flow into government bonds, which are interestingly found a secure investment. [8, p. 217 ff]<sup>8</sup>

### 2.2.2 The Willingness to Invest

A good example of the readiness to invest in renewables is the insurance company *Munich RE*. In summer 2012 the company invested several hundreds of millions of Euros in British wind parks. In the beginning of 2013 another few hundreds of millions of euros were invested in French wind parks. The company is planning on investing another 2.5 billion € within the next years. [8, p. 219]

### 2.2.3 Producing Relief

Dirk Müller suggests a simple, yet ingenious way to keep infrastructure projects from being thwarted by *Basel* rules and therefore making them available for aforementioned investments. His suggestion is to add an intermediate step

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<sup>6</sup> ..and possibly other kinds of accounts.

<sup>7</sup> Because they a found risky.

<sup>8</sup> See Attachments for evidence, that insurances are eager to invest in infrastructure projects

between the banks (the side, which has money) and the projects (the side, which needs money).

This step is *infrastructure funds*. *Infrastructure funds* represent a new way of investment. A singular project or a collection of projects are summarized in a fund. Shares of the fund are offered at exchange markets. Those funds would have to be tested for economic efficiency by certified auditors. Then, if certain criteria are fulfilled, the fund can be labeled *infrastructure fund*.

Naming an investment fund *infrastructure fund* after testing its economic efficiency does not yet, according to *Basel II*, allow banks to invest their investors' money freely. The most important step follows now:

German or European governments, depending on how large this reform shall be scaled, have to guarantee the deposits<sup>9</sup>. That way infrastructure funds are as safe as national bonds and banks can invest large amounts of their customers' money without being limited by their own assets. [8, p. 220ff]

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<sup>9</sup> They do not have to guarantee the return, but only the deposits.



### **3 Risks, Advantages and Opportunities**

#### **3.1 Risks for Governments**

Besides the statutory audit by certified auditors the risk for national budgets is rather small. In case the national guarantee has to intervene, the government would still own valuable energy facilities [8, p. 222].

#### **3.2 Advantages for Governments and their People**

Providers of infrastructure funds will be in competition with each other. The better a project is planned, the better the audit results, ergo the rating, will be. If in competition, those projects will be planned for pure efficiency instead of prestige to attract money. The return on investments will almost surely be higher than that of current national bonds; pensions and life-insurance dividends will be higher; a broader wealth will be established [8, p. 222f].

Because there is much less interest to calculate in a project, profitability is increased. The EEG-allocation or other kinds of allocations retrieved in other EU states can be reduced or even abolished.

#### **3.3 Economic Opportunities**

If it were possible for banks to invest their customers' money in infrastructure funds without having to provide equity capital, much larger amounts would be invested to fulfill energy transition. Thus energy transition would be accelerated. Germany or all of Europe would take a step towards energetic autarchy. The dependence on countries with fossil resources would diminish.

Simultaneously an important macroeconomic would step takes place: If lots of investments flow into renewable energies, their storage and transmission, research and development are being encouraged. Europe could become a technological pioneer, which would secure exports for the next decades.

Massive amounts of private assets represent an economic stimulus package without the government investing a single cent. Like in regular business activity support programs, the invested money would roll through the system

several times, which will lead to economic revival. All this is possible by only pronouncing a national guarantee.

### **3.4 Technological Opportunities**

Instead of subsidizing single technologies as mentioned under the header number 1.4.1, the market will decide what technologies are most promising. Without direct subsidies all technologies will find themselves in the same competition. The most valuable ideas will attract most investors' money. A kind of evolution will take place in the field of renewables. Like with other technologies, efficiencies of renewables will improve a lot once large amounts of money are invested.

### 4 Conclusion

With a rather simple adjustment to laws promoting energy transition (like the German EEG) Europe can benefit in multiple ways. All that has to be done is guarantee investments in pre-audited and therefore to a minimum level secure infrastructure funds.

The pros are numerous:

- An accelerated energy transition and therefore a step towards economic autarchy,
- A massive economic stimulus package without having to invest a single euro
- An alternative and lucrative new way of investing for pension funds and life insurances
- A stimulus for development and research with the potential to make Europe a technological pioneer
- Less allocations on electricity rates
- A non-selective way of supporting renewables and thus allowing technological evolution
- No favoritism for energy-intensive businesses and therefore no exclusion from the real markets

If whatsoever no such gold rush evolves, governments would not have paid a cent and have no additional debt for at least trying.

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