Four Motives of the Energy Transition: Description

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For many years, energy policy played a relatively minor role in Germany. Time and again it would provide issues—the oil crisis (1973), the debate about the planned nuclear power plant Wyhl in Baden-Württemberg (1973–1983), subsidization of hard coal mining in Germany (1970–present), the debate about a new nuclear fuel rod reprocessing plant in Wackersdorf in Bavaria (1985–1989) and limitation of nitrogen oxide emissions particularly from hard coal-fired power plants—but these were not central to the political debate. (It is significant that the 1935 German Energy Industry Act was not substantially altered until 1998.)

The most enduring of these topics has certainly been the debate regarding nuclear energy, which was at least in part responsible for the emergence of the Green Party (today: Alliance '90/The Greens).

However, energy policy has become an established political and social issue in the last 15 years, when the following causal connection entered the international public consciousness and thus also that of German policymakers:

$$\text{Use of fossil fuels} \rightarrow CO_2 \text{ emissions} \rightarrow \text{climate change} \rightarrow \text{potential dramatic consequences of climate change}$$

Despite all the differences in detail, there exists a broad consensus regarding this connection in German society and among most of the political parties in Germany.

A similar consensus has been achieved regarding nuclear energy following the events in Fukushima, Japan, in 2011. In the wake of this event, the CDU, CSU and FDP parties changed their energy policy programs. Since then, the belief that nuclear power is too dangerous to be used permanently in electricity generation has been a common basic motive in German energy politics.

The two central motives of German (energy) politics and of the *Energiewende* are therefore:

– Reduction of CO_2 emissions (limit climate change)

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– Phase-out of nuclear energy (reduce the risks associated with the use of nuclear energy)

Two other, but comparatively less important, motives are (in order of importance):

– Reduction of dependence on fossil fuels (enhance energy security and improve trade balance)
– Promotion of innovation and thus export opportunities for German industry (enhance economic growth)

4.1 Motive 1: Reduction of CO_2 Emissions

Looking closer, this central motive in German energy policy and the *Energiewende* is actually ambiguous. Precisely what is driving the Energiewende policy:

1. The reduction of *national* CO_2 emissions
2. The reduction of *global* CO_2 emissions

It is clear that the problem of CO_2 emissions and ensuing climate change is by nature a *global problem*. Of course, reduction of *Germany's* national CO_2 emissions does contribute to the reduction of global emissions, but only to a negligible extent: Even a steady reduction, progressing so far as to completely eliminate German CO_2 emissions by 2050—i.e. a resounding success of German energy policy in this sense—would, all other things being equal, delay the climate change by a mere six months. In other words, it would be rational for German energy politics to focus on the reduction of *global* CO_2 emissions and to base the choice of political measures mainly on the criterion: how/where can we achieve—with a given amount of money and political effort—the greatest effect?

Despite of this, it is equally clear that German energy politics actually focuses almost exclusively on the reduction of *German* CO_2 emissions. The design of the *Energiewende*, the use of the GREA funds and the political measures are all dedicated to bring down CO_2 emissions from electricity generation in Germany.

In a nutshell, Germany's climate policy and energy politics—as actually the climate policy and energy politics of most developed countries—*should* be driven by the motive in the sense (2), but it is *in fact* driven by the motive in the sense (1).

What Does this Mean in Concrete Terms?

If the German government were to consistently act based on interpretation (2), this could potentially result in very different or additional political measures. Through the (at least partial) use of the funds flowing into the *Energiewende* for fostering the global spread of low CO_2 technologies, or for supporting energy transitions in other countries, it would probably be possible to affect global CO_2 emissions more significantly than through the *Energiewende* in its current design. However, regrettably, German policymakers have not yet addressed this issue

Table 4.1 Voluntary commitment to reducing greenhouse gas emissions (INDC) compared to the baseline year 2005, absolute reductions (in %); December 2015

Country	By 2025	By 2030	By 2050
USA	26–28	–	–
UK	–	38	–
Australia	–	26–28	–
Canada	–	30	–
Japan	–	25	–
Brazil	37	43	–
Germany	33	45	75

http://www4.unfccc.int/Submissions/INDC

Table 4.2 Voluntary commitment to reducing greenhouse gas emissions (INDC) compared to the baseline year 2005, reductions relative to GDP (in %); December 2015

Country	Until 2030	Until 2050
China	60–65	–
India	30–35	–
Germany	65–70[a]	90–93[a]

[a] Derived from the *Energiewende* targets and a nominal GDP growth of 2–3% per year; http://www4.unfccc.int/Submissions/INDC

seriously. Consequently, a more accurate wording for this first motive would be *reduction of CO_2 emissions in Germany*.

With respect to this motive, Germany has set itself indeed quite ambitious and far-reaching goals: compared to the baseline year 1990, reductions of 40% by 2020, of 55% by 2030 and of at least 80% by 2050.

The motive is, by and large, shared by the global community and most other countries, albeit with different conceptualizations and different priorities on the political agenda. Within Europe, it likewise plays a central role in EU energy policy and has, among other measures, led to the launch of the world's first CO_2 trading scheme (ETS), which we will revisit several times later on in this book.

The UN Climate Conference in Paris in December 2015 was an important milestone in the global context. At the conference, many countries expressly pledged to reduce their national CO_2 emissions (Tables 4.1 and 4.2); the urgency of the need to take action and the principal objectives of climate protection were set out in a binding agreement signed by almost all nations.

4.2 Motive 2: Phase-Out of Nuclear Energy

This second central motive for the *Energiewende* relates clearly directly to Germany and the German population.

However, the influence of Germany's energy policy is likewise somewhat limited. Even if this motive is very consistently implemented in the next years, the dangers of nuclear power are indeed going to be reduced, but will continue to exist to a large extent:

- Germany is surrounded by nuclear power plants in neighbouring countries, and nuclear accidents in these plants would also give rise to significant risks for Germany.
- The radioactive waste produced (and still being produced until 2022) through the operation of Germany's nuclear power plants must be disposed of in Germany, with corresponding potential and extremely long-term risks to the environment.

In contrast to the first motive, the second motive in this form is shared by only very few countries, and in virtually none of them it is awarded a similar priority. The few countries that are pursuing a policy of phasing out nuclear energy (e.g. Switzerland and Belgium) are planning to do so over significantly longer periods of time.

4.3 Motive 3: Reduction of Dependence on Fossil Fuels

It may well be surprising at first to see this motive listed as a separate topic. After all, one could object that the motive to "reduce CO_2 emissions" already implies a reduction in the use of fossil fuels, known to account for 85% of global as well as of German CO_2 emissions.

At least *historically*, however, the fact is that this subject predates the findings concerning climate change and is closely linked to the very first appearances of the term "*Energiewende*".

More importantly for our purposes, this motive also plays a *systematic role* independent of the CO_2 issue. There are three reasons for this:

1. Since at present Germany has to import around 70% of its primary energy sources (see Table 1.1), "to reduce dependence on fossil fuels" automatically means "to reduce dependence on other—often politically unstable—countries" in relation to Germany's energy supply. In other words, to reduce dependence on fossil fuels means in fact to increase **energy security**. Both politics and society commonly perceive this as positive.
2. Furthermore, the aspect of **trade balance** is significant. The concern leading to this motive is that, as humanity continues to exhaust fossil fuels, the cost of importing these resources could continue to rise dramatically. This in turn would have negative consequences for Germany's trade balance and national economy. The development in recent decades justifies this concern (Table 1.12):
   - Between 1990 and 1999, Germany spent around € 20 billion per year on energy imports.
   - Between 2000 and 2009, the average spend was just under € 50 billion per year.
   - Between 2010 and 2014, the average spend was already approx. € 85 billion per year.

3. Finally, in this context it is important to mention the—certainly somewhat abstract—principle of a "**sustainable economy**". Though German consumption accounts for only around 2% of global consumption of fossil fuels, the fact is that every day our world consumes large quantities of irretrievable resources that took millions of years to form.

Conclusion
Even regardless of the issues of CO_2 and climate change, reducing dependence on fossil fuels is a traditional and significant motive of German politics. Accordingly, it is frequently brought up in discussions as an argument in favour of the *Energiewende*.

This motive plays a role in many other countries as well, although the manner in which it manifests varies widely. There are countries—even among the industrialized nations—where it is almost nonexistent. In contrast, in the USA this motive, specifically the aim to reduce dependence on *foreign* fossil fuels, is of central importance in (energy-related) politics. In particular, it has been a key factor in the spread of fracking. In other words, the USA has made and is still making considerable efforts to realize this motive (in acceptance of the significant potential environmental damage).

4.4 Motive 4: Promotion of Innovation/Export Opportunities for Germany's National Economy

This motive is again independent of the other three motives for the *Energiewende* and is repeatedly cited in discussions about the *Energiewende*.

Unlike the motives expounded so far, however, this motive is in no way energy specific: Similar effects can be achieved with very different instruments in other areas of politics. Moreover, even if we relate the matter to energy policy, no clear policy direction emerges. Exporting innovative or safety-optimized nuclear power plants or CCS technology (filter out CO_2 in fossil power plants) could also satisfy this fourth motive.

For these reasons, we will address this aspect only briefly in this book.