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Four Preliminary Notes

1
In the last German election campaign, 4 years ago, the focal point of the energy debate were the costs of the renewable energies - both, for commercial customers and for private households. Now the central issue are the medium-term energy solutions and energy infrastructure which our national economy needs.

2
Energy policy is location policy. We have to realize: Industrial power of the past *ever faster* looses its value. The industrial assets and advantages of today will be redistributed in the energy world of the future. Just look at *Volkswagen and Tesla*. Who will win? It is really open. Energy policy can create new market champions.

3
Nuclear energy has no future. Massive opposition started quite emotionally more than a generation ago. Today acceptance broadly vanished.
And besides: Demolition of power plants and nuclear waste storage put an extremely high financial burden on way to many future generations.

4
I suggest to take the following assumptions as a basis:

a
The demand for electricity will significantly rise. Although economic growth meanwhile is uncoupled from energy consumption. But: E-mobility and new *heating plus storage* solutions need considerably more electricity.

b
Only renewable energies can cover the rising power demand. Of course, energy efficiency and storage will add to generation. But neither of these technologies can replace renewable energies. It is because of availability and of costs.

By the way: Both Germany and Chile are rich of energy resources.
Yes: We have only little deposits of oil, gas and coal.
But: We have unlimited natural resources of wind, solar and geothermal.

c
Meanwhile, renewable energies are competitive with fossile energies.
Soon they will be -price-wise- even advantageous.

Three observations:

1
The era of coal is drawing to a close. The end is not far off.

2
The focus belongs to climate politics, NOT to energy politics.

3
In Germany, key issue after our elections will be a completely new organisation of our energy markets.

To these observations in more detail:

Observation 1:
The era of coal is drawing to a close. The end is not far off.

In Germany the share of coal and lignite in the energy supply is decreasing. On 21 April, 2017 for the first time since 1882 British coal power plants produced a whole day not a single kWh electricity. Canada, France, China and others speed up their decarbonisation strategies.

Three reasons why coal has no future in Germany:
- costs;
- acceptance;
- divestment.

Coal recently lost its comparative cost advantage. In contrast, innovation and *economies of scale* made the generation of renewable energies very attractive.

Without massive state subsidies coal power plants could not survive. Only the argument of jobs keeps them running in Germany.

Moreover, coal power plants profit from the renouncement of pricing for the ecological, health and social costs of carbon emissions and other pollution. Nitrogen oxides, mercury, fine dust, sulphate in drinking water - nothing of it has a price tag for the industry. Not in Germany, not in Chile, not elsewhere.

All these facts lead to a strong decline in acceptance of coal power plants among the general public. Therefore, I don't expect a permission for any new plant anywhere in Germany. And German energy suppliers changed their strategy anyway.

Strongest argument against coal, oil and gas, however: If we choose renewables, then we turn energy imports into domestic investment. These investments happen in particular regions, often outside the capitals and other urban areas. It is regional, decentralised development at its best. EU pays every year 8 bn **€** for fossile imports. Replacing it by renewables, means 8 bn **€** additional value staying at home.

Amazingly, it is the financial sector to be the front runner of the leave-carbon-megatrend. Banks, institutional investors, family offices and insurances delete carbon investments from their portfolios. It is a rather new development. And it is revolutionary.

This new attitude of the financial sector puts significant pressure on oil, gas and coal companies. Everybody knows: Capital markets are very sensitive towards new trends.

The trend is clear:
The market looks for sustainable, climate-friendly investments.
They pull out carbon-related investments.
The headline for this development is: Divestment.

The world-largest asset manager, Blackrock (New York), now attach importance to green bonds. The Rockefeller family foundation sells its carbon assets (in Exxon). The same do global insurance companies like Allianz, Munich Re and the Norwegian pension fund, the second biggest worldwide. The largest loan creditor for the German coal industry, Deutsche Bank, decided to end financing this industrial sector.

State institutions follow. The parliaments from IRL, NOR, NSL decided to divest from carbon assets for their public pension funds. So did cities like San Francisco and Berlin as well as universities like Harvard. Some German parties already demand a divestment in their election manifesto.

It is for sure: Divestment is on the political agenda.

Observation 2:

The focus belongs to climate politics, NOT to energy politics.

The reason is simple: Extending renewable energies is not a target in itself.
At the end, it is the contribution to economy, climate protection and public health which matters. Above all: **Paris Agreement on Climate Change.**

Yes, renewables force innovation.
Yes, renewables bring more regional added value than nuclear, coal, oil, gas.
Yes, renewables make small and medium-sized businesses strong (engineering, project development, construction, operation, maintenance).
Yes, renewables are favorable for new market participants and competition.

But: The key issue is climate protection. Climate protection must -and will- get *more attention*.

Damages of health, infrastructure and nature, individual + macroeconomic costs of floods, hurricanes, drought, forest fires - the costs are immense. And they rise. Climate policy therefore is *budget policy*, economic development policy, generation policy, health policy.

Climate policy, in particular, is a key factor of global competitiveness.
Because the best solution consists of *innovation and efficiency*. Innovation, that is not about cheaper energy. It's about less input of resources. Avoiding the use of energy, material, transport - that is the target.

Therefore, quantitative goals of renewable quotas are not very meaningful. However, goals for the reduction of greenhouse gas emissions are vital. Since prices rule in a market economy: Policy should consider suitable instruments. Keywords are: More efficient emission certificate trading, minimum prices for carbon dioxide (CO_2), regional solutions, for example within the scope of Alianza del Pacifico.

Observation 3:

In Germany, the key issue after our elections will be a **completely new organisation of our energy markets.**

(There will be a second key issue, but of limited interest outside Germany.
It is a fundamental reform of federal taxes, duties, levies (Abgaben) and allocations (Umlagen) concerning electricity, renewables, carbon and related issues.)

A new legislative and regulatory organisation of our energy markets is desperately needed. *Within one decade from now* the old energy economy will loose its dominant market position.

How did the old energy economy look like in Germany ?

It was an oligarchy of few big elephants. Being close to state and politics, influenced by trade unions. Grown up in a monopolistic environment without competition. Individuals were treated as petitioner to an authority rather than a customer. These elephants are rich, slow, arrogant, aware of their power.

How does the new energy economy, in contrast, look like ?

The future energy supply will be more cross-linked, more regional, decentralised, more diverse, many more market actors. IT and digitalisation are bringing electricity, heating/ buildings, transport/ logistics, grids/ infrastructure together into a big picture. For reasons both of *profitability* and *stabilization of grids* the *three sectors* of power, mobility and heating are being interconnected. Storages are the important interconnectors.

Some grids are being upgraded and expanded. It needs billions of Euro.
But a sophisticated local and regional supply and demand management combined with much more storages
make most of the expensive transmission grid expansion unnecessary.

The North German states of Hamburg and Schleswig-Holstein are in the midst of a 100 mn **€**- project. It shall bring the *proof of concept* that even for the biggest German industrial center a 100 % 24/7-renewable energy supply from within the region is feasible - without long transmission lines.

The solutions for the new energy economy are more intelligent, more technology-driven, more IT-oriented, smaller-scaled. They have a much lower impact on citizens, nature, landscape and the whole environment. And they will cost less for the state, for businesses, for people. It also means: *Adding value will move from generation to ICT.*

The new energy economy is more democratic, offering more economic participation and thus: more acceptance. For example: Innovative battery storages combined with small-scale PV- , wind or geothermal *generation* *plants* make consumers at the same time to producers („prosumers"). Hence, small and medium-size entrepreneurs, farmers, house-owners, even tenants start to produce and to store power at home. At different times of the day/ week / month they are temporarily on the demand side / supply side.

All that will need political attention, political leadership and political action. It needs new legislation for the energy market design. And it needs state programmes for research and development.

But first of all parliamentarians, ministries and political parties have to understand, **where** the market evolves, **what** new technologies have to offer, and **how** digitalization works.

Perhaps, of all challenges this one is the biggest.

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