

## Post Mortem on Germany's Nuclear Melt-Down

Written by Kevin Rosner

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Germany's abdication of nuclear power in favor of an energy portfolio heavily weighted towards renewable energies is an event less than straight-forward to explain and understand. The decision, if gauged as a raw reaction to public opinion-which itself has vacillated in Germany over the years on the nuclear question-tells us as much about how Germans think about energy, its generation, and use as it does to suggest how Germans think about themselves and how they relate to the world around them.

As Europe's industrial giant, Germany's manufacturing employment base of over 8 million people is larger than those of France and Italy combined. Approximately 10% of these jobs are in the automotive sector, an industrial camp tied to oil markets and global GHG emissions, which are exported around the world. If Germany's Green lobby, pro-environmental, anti-nuclear movement was really serious about climate change, GHG emissions, and human health and safety where energy is concerned (there are far more deaths every year attributed to respiratory related diseases from air pollutants than from those related to nuclear incidents in all years combined) than why not call for a shut-down of Germany's automobile industry? Hmmm? The suggestion is meant to be absurd and not seriously intended in contrast to the thoughts and behavior of the anti-nuclear movement which are equally absurd yet seriously intended. The question remains with an economy configured to demand large amounts of power, come rain or shine, why then would Germany rush to judgment about its own nuclear power sector? Or better put how can this be explained?

One explanation may be in a year after the Merkel government chose to extend the life-cycle of the country's nuclear portfolio, it turned to pure political pandering to an electorate that had already booted the party out of office earlier this year in local and regional elections such as in Hamburg and Baden Wuerttemberg. While this explanation may not be palatable it is at least understandable. Germans, like Americans, have not been huge proponents of nuclear energy since the 1986 Chernobyl nuclear disaster. Recent events in Japan only amplified these concerns reticent or vocal. Yet according to a survey of German public opinion regarding the use of nuclear power for generation purposes carried out in December 2009, 51% of 'informed' Germans ( [upper class business-press readers](#) ) supported nuclear as a possible generating technology.

Underscoring this is the prevalent generalization that Germans see themselves or are seen as earth-first rationalists out to rid the world of all the carbon the industrial revolution brought with it (the same revolution that brought along democracy, increased life expectancy, freedom and personal choice that those with wealth can often afford throughout much of the world). Nuclear energy is after all a zero-carbon emitter. In a turn away from a more diversified energy portfolio that includes nuclear, Germans seek and in fact may be able to revolutionize their own energy portfolio and in their own terms make the world 'safer' by gutting the world's nuclear industry, including their own; it is hubris and a mumbo-jumbo of misinformation that they can make the

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world safer by shoving this same vision down the throat of the billions of the world's poor who today risk starvation, death and/or disease due to lack of access to power and water (itself dependent on energy availability). In short the Merkel government and Germany have the sovereign right to make their own energy choices but not at the expense of others.

A more troubling examination as to what underscores German energy policy, and its links to the security of the German state, are far more worrying. The decision suggests an abdication of the German public's sense about the importance of their own personal responsibility for their own energy future by turning over the fortunes of the German state to Helios, the Greek God of the sun, and to the Anemoi the Greek wind Gods. While public opinion may have swung against nuclear spurred by events half-way around the world, how will the same public react to blackouts or brown-outs when the lights flicker after the last nuclear plant is shut-down or when German energy-price driven inflation drives the cost of all goods and services higher due to the cost inefficiencies of renewables combined with the necessity of importing power from abroad to keep the lights on? Since this decision was taken Germany has yet to experience a Winter season, a typical period of high energy demand, so the pending Winter of 2011 will be a watershed of sorts to see how this decision plays out across Germany warts and all.

Secondly at a time when the EU's solidarity is being severely tested by the sovereign debt crises in Greece, Ireland and Portugal, the EU needs a stronger not a weaker Germany to bolster many of its ailing member-states. The risk of economic contagion across the Eurozone remains requiring engagement not retrenchment. Unfortunately, the German public seems to have lost taste for the Euro due to the indebtedness of other Europeans who coincidentally bought their German cars, Siemens computers, and Bosh dishwashers which in turn has helped keep Germans employed over the past decade since the introduction of the Euro. In the decades since the reunification of the two Germanys, the country has played a vital role in investing in its own near-abroad (the countries of Central and Eastern Europe), in supporting the democratic development of these former Warsaw Pact nations, and in closing the gaps created by the rift left after 40 years of Communist rule over Germany's neighbors to the East. If German engagement has equated to the exercise of its soft power for peaceful purposes what does German retrenchment equate to?

Finally, the decision to turn Germany turn away from nuclear power will also plunge the country into the unenviable position of being a net energy importer with seemingly little thought given to how this might affect energy prices, supply and generation in other European countries, the knock-on effects of increased GHG emissions from replacing nuclear with an increased need to import power generated from coal as one example, not to mention the impact this will have on the country's own foreign policy. With great power comes great responsibility; the country rightfully may enjoy the fruits of its power but must be held accountable when it abdicates the burden of responsibility that accompanies such an enviable position.

### First the numbers□

Wiping nuclear energy from the map of Germany's energy mix, presently standing at approximately 25% of all power generated in the Federal Republic, is not as clean as it first appears. In order to replace its domestic loss in nuclear generating capacity, it will in fact have to increase imports of nuclear power from France and coal-fired power from Poland, its two largest and proximate neighbors. Apparently, it is acceptable for Germans if the French radiate themselves just as long as the prevailing winds don't blow from West to East across the border. Beyond this is the fact that, the bulk of Germany's power already comes from coal. According to an example provided by [one analyst](#), if 7GW of closed nuclear plants in Germany are not brought back online this means increasing by 8 million additional tons of coal imports to Germany. If they stop all new nuclear projects globally, coal consumption will increase by 80,000 tons between 2010 and 2020. So much for a clean German energy future. Therefore conversely, Germans will also harbor a distaste for the impact of GHG emissions on climate and on the decreasing quality of air breathed in Germany (a migratory air space that it shares with Poland) after Poland increases its coal-fired electricity generation and exports to Germany to make up for Germany's lost domestic nuclear capacity.

Of course, German renewable energy enthusiasts do not support the roll-out of new coal fired power, in Germany or elsewhere on the planet for that matter, preferring to supplant lost nuclear power with wind and solar. However the fiscal implications of a ramping up of wind and PV on the German public let alone the real 'green employment' value of adding wind or PV jobs has apparently not been adequately appreciated by the German public. According to a [study](#) carried out at Germany's Bochum University, implementing wind and solar power has already raised household energy rates in the country by 7.5%. This is largely due to the feed-in tariff rates (subsidies) for solar PV and wind, which in the case of the latter, is some 300% higher than the conventional cost of electricity generation according to

[Kenneth Green](#)

at the American Enterprise Institute. When it comes to employment generation from renewable energy, the figures are even more dire. Those in Germany looking at the employment generation cost and potential of new PV and wind jobs need to look no further than the experience of Spain. According to a 2009

[study](#)

carried out at the University of King Juan Carlos I, since the year 2000 renewable subsidies have created less than 50,200 jobs in that country. This amounts to 0.2% of Spain's workforce and 0.25% of Spain's employed workforce. The average subsidy per worker added in these three sources of renewable energies [mini-hydro, wind, and solar] is more than half a million Euros (€571,138), ranging from €542,825 per worker added in or by the mini-hydro sector and two-thirds of a million Euros per worker added in or by the photovoltaic sector, to well over €1 million per worker added in or by the wind industry. In a recession-plagued Europe, can Germany really afford this renewable cost? To think of it another way, in an era characterized by increasingly stingy European defense budgets and contributions to NATO as Europe de-militarizes on the basis that no credible conventional threat exists to its peace and security, tight energy markets are in fact one of the new landscapes for potential conflict. This is the

raison d'être for the creation of NATO's new Emerging Threats and Challenges Division in order to confront new challenges to North Atlantic peace and security from cyber insecurities to terrorism and yes to energy security. Germany needs more, not less, energy supply, transport, and power diversification to confront and provide resilience to potential new geopolitical challenges where energy is concerned. A non-nuclear powered Germany weakens the nation's diversification portfolio and consequently the energy security of the state, putting it at risk.

### Beyond the numbers

Beyond the questionable value that the decommissioning Germany's nuclear industry would have for German households, on a perceived positive impact on employment, and on the real, overall level of GHG emissions into the atmosphere from replacing a virtual carbon-free technology (nuclear) with either more expensive wind or solar that simply cannot provide reliable, base-load power with dirtier coal or natural gas is the loss of soft-power and influence that Germany may experience on the world nuclear stage as a result of this move.

Germany is a party to the Nuclear Non-Proliferation Treaty (NPT) as a non-nuclear weapons state. Its safeguards agreement under the NPT came into force in 1977 and it is also under the Euratom safeguards arrangement. In 1998 it signed the Additional Protocol in relation to its safeguards agreements with both IAEA and Euratom. It is also a member of the Nuclear Suppliers Group. German regulatory policies, the ability of the country to integrate shared experience from the past through the IAEA into updated public policies, their ability to improve operational policies and technological safeguards to prevent future incidents from occurring is admired globally. Shutting down Germany's nuclear industry would be a loss to the country's operational experience, policy implementation, and development of new nuclear technological safeguards. So too would this action threaten the nation's ability and capacity to positively influence the policies, safety, and reliable construction of new nuclear facilities in countries like China and India. Despite the public relations fallout from recent events in Japan, it is expected that both China and India, and others across Asia and elsewhere in a nuclear-inspired world, will continue to unabatedly add to their nuclear generating capacity. Non-nuclear enthusiasts would also have to agree that the world would be better served by a replication or adaptation of German nuclear regulatory policies in places like China and India than without a German presence at the table. Is this reality, and responsibility, one that the German public is willing to burden?

Another knock-on effect of a denuded nuclear-powered Germany, would be increased threats to its own energy security. As already mentioned, renewable such as PV and wind cannot provide reliable, base-load electricity. If Germany proceeds with a plan to replace nuclear with wind (at least in the northern part of Germany adjacent to the sea) then the [UK's experience with wind-power](#) in December 2010 might first deserve review. In December the UK's 3,153 turbines produced a mere .2 %—

(one-fifth of one percent)— of the needed power during a time of bitter cold. Operating at peak efficiency the turbines should have been able to provide almost 10% of the needed power, but unreliable wind had the turbines functioning at less than 2.5 percent of their capacity. Germans might want to consider this experience as potentially part of their own Nein Danke nuclear future. Beyond this, and by far the elephant in the room that Germans themselves don't want to talk about, is what a move to unplug Germany from nuclear power would have on its natural gas dependency.

As Europe's most populous nation, [Germany](#) imports 85% of its natural gas and is already more reliant on Russia to meet its needs than the European Union as a whole. Germany imports about a third of its gas from Russia, compared with about a quarter for the EU. This dependency is only set to increase after the Nord Stream pipeline comes on-line. It is worth noting that former German Chancellor Gerhard Shroeder is Nord Stream's 'Chairman of the Shareholder's Committee' and took the post only months after leaving political office and only then after bank-rolling the project with a German government 1 billion Euro credit guarantee for the project itself. As Germany turns away from nuclear, the void this creates can be partially filled with Russian gas including the outright energy dependence and political leverage Russia's leadership has already exacted from this relationship. The implications of a denuded nuclear Germany therefore has implications far afield from energy itself and goes to the heart of the foreign policy independence of Europe's most powerful state. Germany's foreign policy strategy with the Russian Federation has already contributed to a wedge between NATO member states e.g. Donald Rumsfeld's characterization of an Old Europe of established democracies versus 'New Europe's' newer ones themselves which remain twenty years after the collapse of the Berlin Wall, largely energy dependent on the former Soviet state. Greater dependence on Russian gas, and a failure to develop diversified alternatives to increasing dependence a move thwarted by a very cogent Russian foreign energy policy, will only lead to further divisiveness within the European Union and among North Atlantic states where energy is concerned.

### Germany for Germans

No matter how you cut it, the fact that Germany will denuclearize its power grid and economy will have important, and heretofore, unforeseen implications on European energy security on the whole. Little thought seems to have given, or has yet been calculated, of the net costs and yes benefits to some of such a shift in this nation's energy portfolio. This consideration should be made both for the German consumer as well as for Europe in general. On the side of the German consumer, aside from the government having to compensate Germany's nuclear industry for the shut-down which itself is estimated to be in the billions of Euros it will also have to make significant investments both in the country's renewable energy generating capacity and its transmission grid. According to the [European Climate Foundation](#) Germany will have to invest nearly 30 billion Euros, rising to 65 billion Euros annually by mid-century in order to de-carbonizes its power sector. While this massive amount of public and private debt may be hypothetically doable, it remains uncertain whether Germany's private sector and taxpayers

would be willing to shoulder the burden. If recent griping about German contributions towards bailing out debt-ridden EU nations are any indication of how Germans face and fear debt then the feasibility of taking on additional debt in a time of government austerity does not seem likely.

There is also the issue of the impact on Europe of a denuclearized Germany. Will this spur more coal-based power generation and if so where? Might this even act as a catalyst for even more nuclear plant development outside of Germany's borders designed to satisfy augmented German demand for power? What are the projected macro-economic implications of this power shift both on the German economy as well as on the Eurozone economy and the value of the Euro itself? Do these developments coincide with Germany's anti-nuclear lobby and if so whose side are they on?

There will also of course be those who benefit from the shut-down including those in the wind and PV industries, France's EDF that exports nuclear power to Germany to site one example, and the Russian Federation that may end up being the biggest recipient of this vision for German energy policy as it sits atop the largest proximate reserves of natural gas capable of filling Germany's nuclear void in the short to medium term. The completion of the Nord Stream pipeline seems to make this likelihood more inevitable. The energy security dimensions of such a shift in Germany's energy portfolio clearly disregard events of recent European energy history most importantly the Russian cut-off of gas deliveries to Ukraine and writ large Europe in both 2006 and 2009. Having said this, Germany's closer relations to Russia and the importance of the energy quotient in this relationship may reflect another particularly German view of the future and stability of the Russian state itself. In short, in order to guard off long-term implosion of the Russian state whose economy 20 years after the collapse of the Soviet Union still relies on 25% of its GDP from energy and nearly 50% of its hard currency earnings from these exports, Germany is helping the Russian Federation stay afloat and in doing so concurrently helping itself. No rational policy maker, from the East nor West, would wish for the Russian Federation to experience instability, unrest and incalculable upheaval driven in part from the collapse or exhaustion of its energy empire; at the same time German, European and international policy makers need to consider the ramifications of greater Russian influence on German foreign policy making, Western security, and the NATO Alliance as a result of greater German and European dependence on Russian natural gas. If Russia's collapse is the real foreign policy concern, delinked from energy, then Germany might be better off in investing in large portions of the Russian economy which itself has been incapable of diversification.

In the end however, it is the grating reality that in the short term a denuclearized Germany will import even more nuclear energy from neighboring France (not a bad thing) in order to satisfy its own energy needs. The blatant hypocrisy of this must be hard for nuclear proponents and anti-nuclear opponents to concede.

### What to do?

First, policy makers and nuclear industry experts need to focus on the real nuclear problem, i.e., not the safety of generating nuclear power but on what to do with the waste. This is the real looming challenge that has long plagued nuclear operators and consumers alike. Fixing the waste issue will go a long ways towards ensuring nuclear energy is a part of the global energy mix.

Second, Germans and Europeans should reassess and better understand the full range of implications of a complete shut-down of Germany's nuclear industry on the country and on the EU. This assessment should include analyses both on future cost and availability of power in Germany as well as on the upstream cost and price of power where it is produced for export to Germany.

Third, phase in the shut-down if it is to happen guided by an assessment of what will be required to replace it domestically and how long this will take regardless of alternative power source.

Fourth, offset a spike in Russian gas imports with an expedited assessment of the feasibility of unconventional gas development in Germany and encourage similar assessments across Europe.

Fifth, examine the foreign policy implications of de-nuclearizing Germany's power portfolio particularly with a view towards its relations with the Russian Federation.

The world needs, requires and yes deserves a responsible and engaged Germany in energy, finance, and foreign policy to start with. The twentieth century required massive inputs of blood and treasure to get Germany kicking and screaming to become the admirable democracy it is today. Empowered nations, like Germany and the United States must shoulder the burden that others cannot, to do what others are unwilling to do, and to consider the global implications, both positive and negative, on how the decisions they make at home may shape policies abroad.

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