

## Get FIT: Public Policy, the Smart State and the Energy-Environmental Revolution 固定価格買い取り制度—公共政策、賢い国家、来るべきエネルギー源・環境革命

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### Get FIT: Public Policy, the Smart State and the Energy-Environmental Revolution

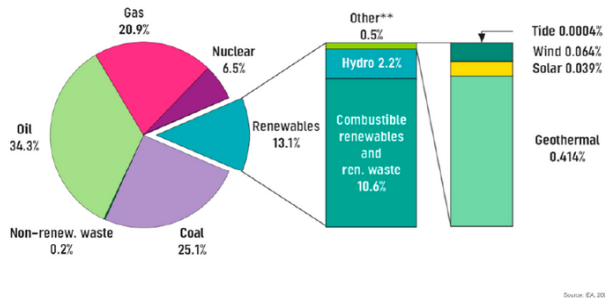
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Shi Zhengrong, founder and chief-executive of China's Suntech Power, now the largest crystalline silicon solar module producer in the world, tells us that "policy is the only leading force for climate change."<sup>1</sup> Concerned about greenhouses gases and conventional energy supplies, the International Energy Agency declared in its World Energy Outlook 2009 that the world needs a "much faster roll-out of renewables," through investment exceeding USD 4 trillion over the coming two decades. And the January 31, 2010 New York Times warns, in tones reminiscent of the 1957 Sputnik shock, that China's policy-driven efforts "to dominate the global manufacture of renewable energy technologies raise the prospect that the West (sic) may someday trade its dependence on oil from the Mideast for a reliance on solar panels, wind turbines and other gear manufactured in China."<sup>2</sup>

We appear to be in a new era. After nearly three decades of neoliberals re-engineering the state into an almost invisible hand, robust, strategic public policy is returning to the agenda. Crises in finance, energy and other core areas have compelled the state to act, and the only questions are how far and how effectively. The state is also growing again, and

this expansion needs to be shaped so as to maximize the benefits for economy and society.<sup>3</sup> As this paper argues, we need smart and transformative policy, not merely more spending. And we especially need more of the public policies that are already transforming the energy sector, the world's largest market.

Let me cut to the chase, so to speak, before turning later to a critical review of economic common sense hitherto as well as the details of what is unfolding (especially in Japan). I want to show at the outset that a revolution, increasingly being deemed a full-fledged industrial revolution,<sup>4</sup> is underway and centers on using renewable energy technologies to generate power. Germany, China, Spain and myriad other examples illustrate that ramping up renewable energy capacity offers not only cleaner power generation, but also the prospect of cheaper power whose production is distributed throughout the community. This pattern of distributed power production (and hence diffusion of economic opportunity) is the reverse of the 20th century centralization of power production in large facilities owned by monopolies or oligopolies. And that deep threat to vested interests is why the revolution moves erratically in specific national contexts: emergent and incumbent industries are battling with unprecedented ferocity.



## Can there be economic growth without growth in Energy?

Energy is not as familiar and visible to us as automobiles, the internet, and other everyday commodities, but at roughly 10% of the global economy energy markets are in fact many times larger even than infotech.<sup>5</sup> Yet energy is generally taken for granted, so we rarely think about what generated the electricity that flows when we flick a light switch. Most of the products we buy, our computers, our cars, our homes, and the like, can be seen as means of consuming energy. And all of our purchases are embodied energy.<sup>6</sup> The barely visible ubiquity of energy consumption in our lives is one reason energy firms dominate the top ranks of the Fortune 500 and other indices. At the same time, there is a contrasting lack of interest in the political economy of all this.<sup>7</sup> And this fact is even more true of the political economy of the ongoing energy revolution, which tends to be dismissed as the hype of wide-eyed idealists. Energy production and energy policy are also laden with obscure terminology, the confusing details reminiscent of the early, user-unfriendly years of the internet. Yet it is worth learning the jargon and policy mechanisms used by energy specialists, investors and institutions. As we see in the global competition to attain “Green New Deals,” this sector is rapidly moving towards the centre of national and global politics.<sup>8</sup>

## Towards a Sustainable Energy Transition

As to the most salient energy-policy success

story, Germany, let me quote at length from a recent analysis by the Deutsche Bank Climate Change Advisors:

“Germany is a prime example of how governments can help lead the transition to a cleaner energy supply through a longterm and comprehensive policy framework, including a guaranteed connection to the power grid.”

This “guaranteed connection,” a policy innovation called the “feed-in tariff”, or FIT, is the core of Germany’s policy framework. It is the key policy innovation driving this revolution. The FIT sees the state sector determine extra levels of payment (above prevailing rates for baseload electricity) for such renewable energy sources as wind, solar, geothermal and the like.<sup>9</sup> Along with determining these extra levels of support (hence, the “tariff” in feed-in tariff), the state also determines how long the guarantee will stay in place (generally 20 years). It also puts in rates of decline - referred to as “digression rates” - for the respective tariffs, to encourage technical innovation and cost-cutting in the various renewable sectors. Then the state mandates the electrical utilities to collect this tariff-derived funding from consumers and transfer it (via the purchase prices for renewable-generated power) to renewables producers. In other words, the money does not come from the public budget.<sup>10</sup>

Let us read further, and see how the Deutsche Bank report evaluates this policy’s results: “As a result of the policy framework, the renewable energy sector in Germany has been characterized by steady growth rates over the past years, with a significant increase in capital

investment across various clean technologies. Germany has saved 57 million tonnes of CO<sub>2</sub> directly through implementation of its Renewable Energy Sources Act of 2000. At the same time, Germany has created almost 300,000 jobs in renewable energy sectors, of which 60% in 2007 could be attributed to the Renewable Energy. Germany has also established a world-class position in some technologies."

Financial institutions are generally not inclined to report that explicitly interventionist state policy has performed marvelously, so it seems worth reflecting on that fact. Deutsche Bank is telling us that the FIT is driving productive, cutting-edge growth in Germany. And note that this growth is not some imaginary effect achieved by, as it were, robbing Peter to pay Paul:

"The costs of Germany's climate policies have been modest. The proportion of the residential electricity rate calculated to be attributable to the Renewable Energy Sources Act of 2000 (feed-in tariff) rose from around 3% to 4% between 2004 and 2006, a very reasonable cost for what has been achieved."<sup>11</sup>

Policy and politics in energy markets are clearly worth analyzing in depth. The FIT that Germany has pioneered is being adopted at a blistering pace, with over 60 national and regional governments (including most EU countries, China, India, and the Canadian province of Ontario) having installed it as of 2009.<sup>12</sup> The policy is now being promoted globally by the International Renewable Energy Association (IRENA (<http://www.irena.org/>)). IRENA was officially set up on January 26, 2009, and had attained 139 member countries by January 17 of 2010.<sup>13</sup>

In another signal shift, the long dominance of ever-more deregulation for energy markets lost one of its most vigorous champions. The UK regulator Ofgem, which has hitherto sought to let markets shape outcomes, stunned observers with a February 3, 2010 declaration that "leaving the present system of market arrangements unchanged is not an option" due to the reality of an "unprecedented combination of global financial crisis, tough environmental targets, increasing gas import dependency and the closure of ageing power stations."<sup>14</sup> Without aggressive state policy, including stronger regulation, compulsory investment requirements, and perhaps even a state agency at the centre of power purchasing, Ofgem sees blackouts and gas shortages in the UK's future.

But note also that a willy-nilly reregulation is neither warranted nor in the cards. The important point is the adoption of smart policy, as this sector is the core of the present economy and the key to its transformation.

### **Why is this Happening?**

Recall how the 2000s were supposed to turn out in Japan, the US, and globally. Deregulation everywhere, but particularly in financial sectors, was going to open up a cornucopia of "new economy" growth in advanced technologies and high-tech services.<sup>15</sup> The simultaneous erosion of manufacturing capacity in developed economies, most notably the UK and US, unsettled mainly a dwindling band of seeming Luddites concerned about blue-collar interests. By contrast, the neoliberals of Wall Street and The City (London) saw the disappearing manufacturing base as yet more proof of a healthy transformation of the global economy. Advanced economies were encouraged to embrace a division of labour wherein US-style "FIRE" (finance, insurance, real estate) financialization of the entire economy was the brass ring. Low-and medium-technology

manufacturing could be sloughed off, like old skin, to such low-cost developing countries as China and India. Relieved of metal-bashing industries, the developed world would advance even faster and further, accumulating ever more intangible assets centring on financial and business services.

In tandem with this facile recipe for having “them” make increasingly cheap things while we make serious money in services, came an enormous expansion of imports. Between 1998 and 2008, the enormous growth in merchandise exports grew to USD 15.8 trillion and easily outpaced the expansion of GDP.<sup>16</sup> This mushrooming of international trade was fostered by cheap fossil-fuel energy, its effectively infinite supply taken for granted.<sup>17</sup> Developed countries that resisted this finance-led and oil-fueled globalization, and sought to protect their manufacturing base, were seen as relegating themselves to inefficiency and a secondary role in the competitive new order.

In this heady time, this “age of abundance,” Japan was of course firmly mired in its “lost decade.” of deflation and dwindling prospects. International and domestic neoliberal advice focused on shrinking Japan’s state and loosening its grip on the private sector. The Wall Street Journal’s editorial pages, The Economist and other free-market cheerleaders applauded Japan’s 2001-2006 Koizumi regime for a neoliberal agenda that deregulated labour and other markets, shifting risks to individuals (especially younger and female ones). The Koizumi reforms would inevitably (or so it was claimed) amplify the appetite for work<sup>18</sup> and investors’ incentives to seek advantage in the advanced sectors of the global economy. They were also, more credibly, seen as a means to encourage more competitive service sectors in the domestic economy. Overall, cutting Japan’s regulatory, fiscal and other public-sector mechanisms was seen as the key policy stance for reinvigorating a country that had already

“lost” a decade in the wake of the implosion of the 1980s bubble in property, stocks and other assets.

Of course, the 2000s turned out to be quite different. Rather than an ever-smaller state and ever-bigger economy, the decade brought an unsustainable imbalance of consumption and production centered on the American consumer and the Chinese producer. This imbalance was largely sustained by Chinese investment of its massive trade surpluses in US Treasuries. And nicely completing the mix was negligible oversight in American financial markets. The flood of money and the lack regulation allowed Wall Street’s wizards to brew up a bewildering array of securitization-centred financial innovations that fuelled an enormous bubble in American housing prices. The collapse of this bubble in turn blew up the high-tech financial service sector's securitized gimmickry, vapourizing USD 11 trillion of wealth in the US alone. The chaos that ensued saw financial markets go, quite literally, right to the edge of a meltdown as a result of the striking loss of faith in the creditworthiness of virtually all private-sector counterparties. And this “credit crunch” in turn drove the developed economies and the rapidly expanding global trading economy into a decline that at times exceeded anything seen during the 1930s.

In consequence, the long-disparaged state rushed back with an unprecedented scale and speed, as over USD 17 trillion worth of economic stimulus and liquidity programs were rapidly adopted by the major economies in order to stabilize their financial sectors and jumpstart activity in their real economies. In America, these policies built a Potemkin recovery in finance from the spring of 2009, one that may now be starting to unravel through the fiscal crises in Greece and Portugal.

What is certain is that the American financial recovery has, allowed an even more

oligopolistic Wall Street to trade as it wishes knowing that the state is effectively compelled to bail it out or go with it into the abyss.. So especially for those long accustomed to seeing the state shrink, the turnabout in public policy and spending, with its massive government help, is politically loathsome. It is also seen as an insane leap into the risk of public-sector debt traps and hyperinflation. Some of this outrage is on the mark, as the Obama regime should have nationalized the banks and helped the real economy (“Main Street”) rather than mollycoddle Wall Street as they foreclosed, fired and fleeced with higher credit charges. At the same time, withdrawing public-sector supports from financial markets (and especially those in America), housing and other markets threatens a quick return to something like the chaotic months following the mid-September 2008 collapse of Merrill Lynch.

So we are stuck between a rock and a hard place. The rescue policies are essential for keeping the economy from collapsing again. But gargantuan as they are, they are still insufficient for resolving the problems that brought us here in the first place. They have in fact bolstered the positions of vested interests in financial, energy and other markets.

The mounting damage from serial bubbles, environmental destruction<sup>19</sup> and a host of other effects show that an economic transformation is clearly essential. Only the public sector can lead such a transformation. Yet in large part, the present financial policies simply offer a bigger state socializing the risks of the FIRE economy. And on the fiscal side, stimulus policies centre on getting back to business as usual. They offer precious little guidance to the investment shifts and other changes that are essential to moving towards sustainable growth. The priorities are therefore wrong, and we see this in a public debate that recycles tired slogans about big government versus small government, Keynesianism versus fiscal austerity.

## Go Where the Puck is Going

As argued earlier, a rapid transformation in energy markets - fully 10 percent of the USD 60 trillion global economy - is particularly urgent. One reason we need such a transformation is cost, and here I focus on market cost rather than the steadily worsening costs of global warming, geopolitical risks, and other myriad negative externalities of fossil fuels.

Energy prices are deeply implicated in the striking collapse of the neoliberal economic paradigm, but this aspect is routinely overlooked in the public and academic debates. Various researchers have persuasively argued<sup>20</sup> that a primary trigger that brought down the housing bubble’s latticework of structured finance was the rising price of fossil fuels, especially oil. When oil prices peaked at USD 147 per barrel in the summer of 2008, according to this perspective, they helped tip the economy into recession by sucking away a significant increment of American consumers’ purchasing power. People who took out subprime loans to buy homes far from urban centres had accepted that they would commute, using private cars,<sup>21</sup> vast distances to their place of work. But they never bargained for skyrocketing fuel costs. They watched helplessly as their disposable income disappeared into the pockets of oil producers. And then they found themselves unable to pay their mortgages and unable to sell their homes. And as that happened, the rest of us watched a financial crisis erupt.

Having helped deflate the bubble, the benchmark oil price dropped precipitously from USD 147 in the months that followed. It reached bottom in the USD 30 per barrel range<sup>22</sup> early in 2009, but in early 2010 it is back in the USD 80 per barrel range. Now even Goldman Sachs expects the price of oil to blow through the USD 100 per barrel level by next year.<sup>23</sup> In short, even without a sustainable

recovery, we see the core energy price already at historically high levels (and this is true for commodities in general). The cheap energy that was the so-called new economy's overlooked pillar thus turns out, upon inspection, to have been perhaps its most glaring vulnerability.

And though still largely ignored, the energy issue will not go away. The commonsense of the 1990s and much of the 2000s was that price signals would liberally grease the way towards virtually any important policy goal. By this reasoning, higher oil-product prices would cause discomfort and encourage users to consume less or seek alternatives. Rising prices would also attract more investment to bring new supply to the market. Hence, higher prices for oil would, over the medium to long term, and perhaps even in the short run, lead to even lower prices because of the predictable incentives and responses inherent in price increases.

This confidence in the singular efficacy of prices was gradually undermined as the decade of the 2000s wore on. It became clear that there were intervening factors such as increasing costs of exploration and development, escalating consumption in producer countries as well as the BRICs and elsewhere, and a threatened bottleneck in production capacity imposed by the aging of fossil-fuel producers' workforces as well as the extremely complex and costly infrastructure they require for their operations. Much of this infrastructure needs to be replaced, due to rusting, and a great deal more needs to be built.<sup>24</sup> These realities loomed ever larger in energy markets as the decade wore on, and the once unparalleled optimism of the International Energy Association and other observers eroded quickly.

The decade closed with the annual report of the International Energy Association, a November 11 2009 release titled World Energy Outlook,<sup>25</sup> which warned that the global

community needs massive investment in alternative sources of supply. Much of this concern was, of course, driven by the scientifically undeniable reality of climate change. But it is also notable that the chief economist and other IEA officials and researchers were warning that a peak in the production capacity of the global oil industry could hit before 2020.<sup>26</sup>

Peak oil has of course been forecast so many times that it has become the energy equivalent of "crying wolf." Hearing yet another warning has the apparent effect of dulling the senses, encouraging many people to forget that fossil fuels are finite resources. But no matter when the precise date of the peak - and there will be a peak - it is best to prepare for it in advance. Adjusting to a peak in the supply of oil, a commodity that provides just under 40% of global energy, has already been calculated -- in a 2004 study for the US Department of Energy - - as requiring well over a decade of preparation. Without advance preparation, the approach of the peak would bring great volatility in prices and considerable chaos as well as the imperative of massive emergency policy responses.

In the meantime, cost of oil remains a persistent threat to any global recovery. The more it appears that a recovery is in the offing, the higher the price climbs. And the elevated prices depress economic activity at least as effectively as a tax increase.

As noted, energy was a singularly overlooked aspect of the neoliberal new economy, even though energy transactions are worth about 10% of the global economy, or USD 6 trillion per year. This figure bears repeating because it is so seldom recognized as reality (compare it with world military spending of USD 1.5 trillion in 2008).<sup>27</sup> Energy tends to be taken for granted, but it is the largest single sector of the global economy. Fully 85% or more of energy supply is dominated by fossil fuels. One key

aspect of this dominance is, as Thomas Friedman argues in his "Hot, Flat and Crowded," that generation technologies have not changed significantly over several decades. This is a sector ripe for disruption.

Let us be clear: Certainly the efficiency of key energy generation technologies has been ramped up. And over half a century ago, we saw the development of an entirely new generation technology -- the nuclear reactor. In addition, increasingly high-technology (and increasingly costly) systems are being deployed in exploration and development, including 3-D seismic imaging of oilfields, horizontal drilling, the hydraulic fracturing of oil shale deposits to produce natural gas, the ability to drill kilometers beneath the ocean floor, and so on. But as impressive as these technologies are, they remain improvements within existing paradigms of energy production and consumption. They are not going to lead to reduced geopolitical risks and lower prices nor the lessened environmental damage<sup>28</sup> and other changes that the global order requires to achieve sustainability. Most people appear to have their eyes fixed on financial industries, a reasonable focus considering the clearly calculable damage they have caused. But further reform is perhaps most necessary in our energy industries in order to build new and sustainable growth, and thus avoid what threatens to become a protracted economic malaise.

### **Back to the Future**

All industrial revolutions are driven by disruptive technologies, which not only displace existing technologies (in the way the motorcar displaced the horse), but also often render swaths of businesses vulnerable to so-called "creative destruction." Of course, at the outset of any industrial revolution, the course of events is not only difficult or almost impossible to project, but most observers find it difficult to conceive that established interests in a short

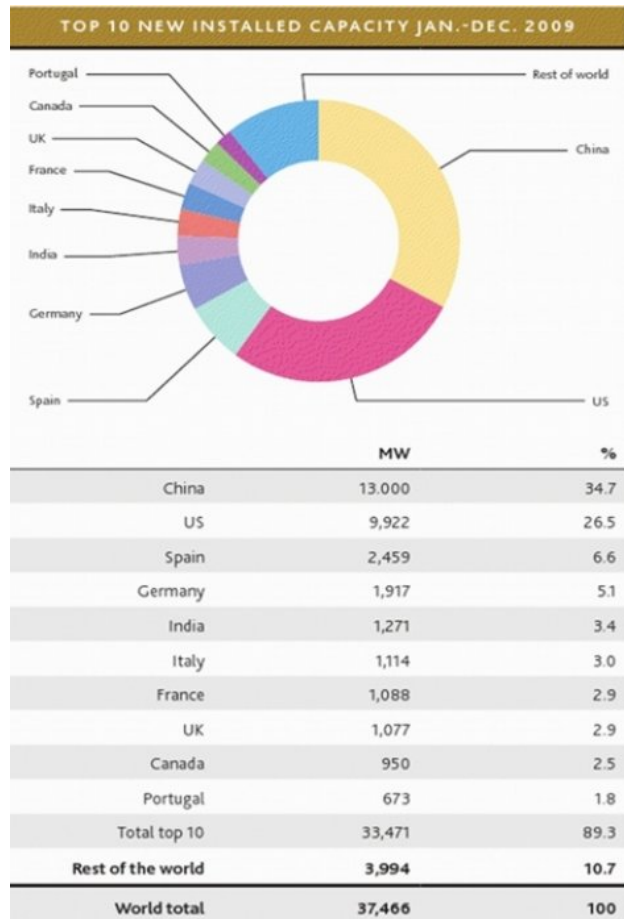
period could become a shadow of their former selves. Few observers, for example, saw the potential on the motorcar -- that sputtering technology prone to breakdowns, with its laughable lack of roads, filling stations and other essential infrastructure -- versus the long-established business of the horse, for which there were innumerable liveryes, feeding stations and other businesses, not to mention an embeddedness in lived experience and daily life. The novelty of any new and disruptive technology, poking its way into core areas of daily life, almost inevitably makes it seem a fad certain to fade away in a short time. In this respect, it is useful to recall that the rise of the internet was dismissed by many as a diversion. But it has gone on to generate an industry worth USD 1 trillion per year in transactions. And it continues to fundamentally change peoples' relationship to the telephone, the personal computer, and other devices as well as with each other.

We seem to be at a similar stage at present. There is a generalized awareness that rapid change is afoot, as the crisis continues to unfold and as words like "smart grid," "supergrid," and "concentrated solar" establish themselves in the press. But perhaps, in addition to ferocious lobbying by vested energy interests, the coincidence of a huge financial crisis and its fallout with the emergence of an energy revolution, has seem them coupled. Whatever the case, there does seem to be a curious desire to cling to the familiar. When it comes to energy, even otherwise well-informed observers seem to think it is absurd to suggest that the energy sector is in the midst of disruptive change via renewable energy technologies. To take one recent example, on January 4 of 2010, the otherwise very perspicacious Michael Lind wrote that "the moment when much-hyped alternative energy sources like wind and solar become competitive with fossil fuels and nuclear energy seems to perpetually recede into the future. The all renewable energy sector is 30 years away --

and always will be."<sup>29</sup>

Yet even as Lind was disparaging the prospects for renewable energy, we had startling news that the Saudis are turning to solar. Saudi Arabia's leadership made an official announcement, on January 25, that they will shift from desalinating water using oil and gas (prodigiously: about 1.5 million barrels per day) to using solar-powered desalination. And they made it clear they will do this in order to reduce costs, using technology their scientific elite have developed with IBM. Not only that, but the country's Petroleum and Mineral Resources Minister, Aki Al-Naimi, declared that "Saudi Arabia aspires to export as much solar energy in the future as it exports oil now."<sup>30</sup>

Along with that unexpected development in the geographical heart of the oil age, major countries of the European Union were connecting their vastly multiplying renewable energy sites. Those countries clustered on the North Sea (Germany, France, Belgium, the Netherlands, Luxemburg, Denmark, Sweden, and Ireland and the UK) are building a EURO 30 billion "supergrid" to interconnect their renewables output and store excess and intermittent generation in, among other places, Norwegian hydroelectric dams.<sup>31</sup> And the energy generation is in massive amounts. The Germans alone had ramped up their generation of electricity via renewables from about "6.3% in 2000 to more than 15% in 2008 -- an increase of more than 200% in eight years."<sup>32</sup> Moreover, some wind farms in especially productive environments are already producing electricity whose costs are at parity with coal-fired power, generally the cheapest form of electricity. And the oncoming freight train of Chinese competition, a country committed to leading this industrial revolution, saw solar panel prices drop, in 2009, by about 30%. This price destruction put the least competitive producers out of business and brought grid parity that much closer.



**Global leaders in wind installation 2009**

The critical aspect of this ongoing industrial revolution, its profound difference from previous industrial revolutions, is the central role of public policies in driving it. Every industrial revolution is, of course, intimately bound up with the role of the state. But hitherto, determinedly mixing state and markets has been the route taken by so-called late-developing countries. As Alexander Gerschenkron pointed out in his work on "the advantages of backwardness," public sectors in late developing countries took a strategic orientation towards the domestic political economy, re-shaping it so as to put it onto a rapid growth track that rivaled the



contemporary industrial leaders. The Meiji-era government in Japan, for example, embarked on a full-scale revolution of the country's political economy and society in order to make it a contender in the industrialization of the late 19th and early 20th centuries. This time looks very different because governing elites in all countries are seeking to use public policies. Ordinarily, the natural leader of economic transformation would be the United States, with its enormous demand, unrivalled capacity for innovation, and other strengths. But the American hegemony of the 20th century was based on oil,<sup>33</sup> and it is unclear that the country has, at the national level, the governance and other strengths that will allow it to lead the transformation of energy markets. The Obama regime's inability to get much done is emboldening vested interests to gut real targets and other policy goals from pending climate legislation. The current industrial revolution is being driven even more decisively than its predecessors by smart policy, and is likely to be at least as encompassing as them. The environmental and energy shifts we are undergoing will rewrite employment patterns, urbanization, job training, and other areas of social and political life. But it may China's one-party, top-down governance that leads.<sup>34</sup>

As noted, one of the most notable aspects of state activity is the use of policies to encourage the uptake of renewable energy technologies. These policies play a key role at the present because renewables are, for the most part, more expensive forms of power generation than conventional means such as burning coal, nuclear fission, and hydroelectric. There are a plethora of policies aimed at encouraging the uptake of renewable energy technologies, including subsidies, renewable energy certificate schemes, and the like. Some of these simply subsidize the purchase price of the relevant technology (eg, a PV panel). Other policies, generally known as "renewable portfolio standards," see national or regional governments adopt targets for the overall

percentage of electrical power that will be generated by renewable energy. Energy producers then make use of subsidies, tax breaks, and other encouragement to reach this target. Renewable energy certificate schemes are extraordinarily complex devices that seek to mimic a marketplace. They do this by mandating renewable production but then leaving renewables producers to accept prices for their product based on the value of certificates traded in quasi-markets.

All of these means have been part of a collective groping in the dark towards the goal of fostering emergent technologies and reshaping a large market dominated by enormously powerful vested interests. These vested interests are of course keen to shape policies that reproduce their dominance in energy markets to the extent possible. Because of this ideological and political economy background too much of the policymaking in energy markets, one tends to see a lot of these reluctant and constrained policy solutions to the overall problem of how you change energy generation in more sustainable directions.

But from within this welter of vested interests and tendentious debate, a clear policy option has emerged and run to the top of the list among effective solutions. This is the feed-in tariff (hereafter, FIT), noted at the beginning of this paper. I return to the FIT again in order to look more closely at the policy and its implications for fostering distributed power and other positive changes. And here, as with the Deutsche Bank report, I want to let the experts speak for themselves again. They rightly call attention to one of the big questions we are addressing when we look at policy in this industrial revolution: the issue is not only who will shape the revolution but how they will shape it, especially whether in equitable directions or not.

The FIT is a policy that was actually first introduced in the United States but whose

current manifestation is largely the result of innovations pioneered by the German political and policymaking community.<sup>35</sup> The FIT is now the central theme of the first comprehensive account of the major policies fostering renewable energy technologies, "Powering the Green Economy: the Feed-In Tariff Handbook."<sup>36</sup> The authors note that the FIT sets "a fixed price for purchases of renewable power, usually paying producers a premium rate over the retail rate for each unit of electricity, or kilowatt hour, fed into the grid. FITs usually require power companies to purchase all electricity from eligible producers in their service area at this premium rate, over a long period of time. FITs also often force all electrical utilities and transmission operators to connect all possible renewable power providers to the grid, and mandate that the utilities themselves pay the interconnection costs, or at least the grid expansion cost. These costs are then distributed among all electricity consumers, minimizing costs while delivering an ever-growing amount of renewable energy. It may not look like it, but a FIT is a truly revolutionary tool - one that changes the role that governments, power operators, grid operators, transmission and distribution operators, and ordinary consumers currently play when it comes to electricity... [FITs] are a way for consumers wishing to generate their own power to receive guaranteed payments, and benefit from additional revenue and the improved reliability of energy supply. These benefits spill over and help all consumers by lowering electricity prices. Electrical utilities benefit from displaced fuel costs and decreased volatility of fuel and electricity prices. Politicians benefit because FITs often jump-start a robust manufacturing sector for renewable electricity technologies, bringing with them tax revenue and high-paying jobs that stay within the community. Business and farmers, among other groups, can install generation equipment and gain extra income, and society benefits from reduced greenhouse gas emissions and greater diversification of the

electricity sector. Properly design FITs can deliver all these benefits, at low cost."

This is creative synergy and it is the precondition for the next major industrial revolution, one that promises to curtail rather than stoke the production of greenhouse gases. The point of the FIT is to encourage as much uptake of renewable energy as possible, as well as encourage technological advances that reduce the cost of using these technologies. There is a tipping point at which the massive renewable energy technologies and the effect of these incentives for cost reductions lead to electrical prices lower than those achievable by conventional means. And as the authors note (pp. xxii), "once we have reached the tipping point, FITs will have done their job, and will only be needed on a limited basis, if at all."

Policymaking for renewable energy differs strikingly from that which we see in, for example, pension policies, healthcare, and other policy regimes that are explicitly designed to be in place for the long-term. The FIT is a tightly targeted, temporary policy intervention in order to deal with the investment disincentives confronting technologies in their infancy as competitive sources of clean power.<sup>37</sup> So this is not the usual reform of policy approaches with an eye to establishing a new bureaucracy and policy regime as a permanent feature of the political landscape. Though Lind, among others, dismisses renewables as forever having a promising future, the fact is that per-kilowatt generation costs have dropped considerably over the past decade and can be expected to decline further - perhaps with increasing speed - over the coming years. As these generation technologies reach a level of sophistication and extent of diffusion sufficient for them to compete with conventional means of power generation, the FIT and other policy supports will no longer be necessary. There will no doubt be political fights in that not so distant future over how and when to shut down the

policies. But such frictions seem likely to be far less than those almost certain to worsen by not shifting to sustainable energy.

The use of FITs is targeted energy policy, in terms of the way they are deployed, but they also include implications for social policy, business policy and a number of other areas. The broad implications of the FIT derive from the fact that it channels politico-economic forces, accelerating these forces while also profoundly shaping them. The FIT not only encourages the uptake of renewable energy technologies; it also has the prospect of encouraging what might be referred to as the "democratization of electricity production." The authors of the feed-in tariff handbook declare early on (pp. xxiv) that they "believe decentralization and democratization of energy production to be a fundamental requirement for the 21st century, a shift in trajectory which will bring wide and deep benefits to those who participate." They regard "the advantages of renewable electricity democratization" to be "economic, financial, environmental, social, political, geopolitical, technical and medical all at once." This follows because the new energy system fostered through FITs and renewable energy technologies is one where the fuel (eg, wind, sunlight, waves) is generally free and abundant just about anywhere. Because fuel is widespread throughout nations, along their coasts, and in their skies, the risks of resource conflicts are greatly reduced. Almost any point of ground, any local community, can become a site for energy production. In concrete terms, that means just about any parking lot, any building, any body of water, any field. At the same time as currently centralized and monopolized electricity production turns toward becoming ubiquitous, its environmental costs are massively lowered through the virtual elimination of air pollution, water pollution, the destruction of land, and other negative externalities. In addition, local economies are bolstered by local production and the ability to keep income within the community as well as

foster a competitive manufacturing sector.

Opposition to FITs, as the authors observe (pp. 10), is generally rooted in the fact that the "alternative mechanisms favor large, credit worthy investors and utilities - who are often the monopoly suppliers of energy. Indeed, other support schemes tend to limit the growth of renewable energies, thus guaranteeing large market share for conventional energy sources which are generally in the hands of large private corporations or oligopolies. We go back to the theme of power and influence. These groups have the ability to guide national public policy in their favor, which can result in a policy landscape that offers little for those wishing to enter the market, or even find a cost-effective solution for putting solar panels on their house or business."

The opposition of vested interests is a major problem, but that appears to be alleviated if renewables projects distribute economic gains throughout the community. The handbook is very clear and consistent on this point, and addresses it with detailed references to comparative studies (many done by the authors themselves). Among the conclusions: "Danish and American experience shows that renewable energy deployment is accelerated or held back depending on whether policies allow or prevent investment and participation on the part of the general public." The authors further argue (again on p. 10) that "from the 1970s, Danish community wind partnerships became increasingly common, with local people pooling their financial resources to invest in their own wind farm. When this model broke down due to the change to less favorable policies, and was replaced by larger yearly business investments, opposition to wind power development increased, as the local population no longer had a stake in the wind energy business."



### Danish wind turbines

These points are extremely important, because at this take-off stage for renewable energy we see an increasing frequency of conflicts over siting projects. Local residents who can anticipate little or no gain from wind farms and the like have the strong incentive of their own aesthetic values, if nothing else,<sup>38</sup> to lobby against projects. Comparative polls show that across the world, publics support renewables by large majorities (averaging over 70 percent),<sup>39</sup> but NIMBY opposition is always ready to flare up when people have no stake in a specific project. Most people, in most countries, are quite conservative and simply do not like change in their lived environment. But when the change brings them a clear pecuniary gain, their opposition generally turns to support.<sup>40</sup> Consider how so many people at present are willing to put up with coal.

Technical issues are also routinely raised to dismiss renewables as a serious contender in energy markets. So one of the most interesting chapters in this invaluable book is the one titled "Dispelling the Myths about Technical Issues." The authors provide several telling examples where even knowledgeable observers of the energy field have declared renewables inherently unreliable and claimed that interconnecting distributed generation is a virtually insurmountable problem. The authors point out that "people who have this view can be compared with those in the 1980s who never managed to believe that something like the futuristic 'internet' would ever work, or those at the turn of the 20th century who thought

humankind would never be able to fly." They take issue with this "conventional thinking" and show that it is often completely wrong or at least seriously misinformed.

To this end, they have amassed an array of unimpeachable studies and the fruits of utilities' and others' real experience. They show that claims of unreliability are grossly exaggerated when renewables are compared with conventional and nuclear production. The dispersed character of renewable resources also has the added benefit of encouraging interconnection, within regions as well as between them. The more renewables that are interconnected, the stronger the network becomes. And at the same time, the more diverse become the business opportunities and incentives to cooperate. This aspect, by the way, is a distinct contrast to the generally divisive politics of conventional and nuclear energy resources, which are geographically concentrated.

Though the authors do not note it, due to its recency, the North Sea countries have broken ground on their EURO 30 billion supergrid project (noted earlier). As of October 20 of 2009, the EU also has a "Desertec" project (incorporated as "Dii GmbH" and including Munich Re, Siemens, and other major firms) to build an array of concentrated solar plants in the North African desert to power Europe as well as some local areas (in North Africa) and the Middle East.<sup>41</sup> These projects are huge in their fiscal scale as well as their politico-economic implications. Smart state policy is driving an economic transformation, and in the process further binding the EU countries together.<sup>42</sup>

Perhaps the impending oil shock will encourage similar moves in East Asia. A "Desertec Asia" concept already exists,<sup>43</sup> and its proponents rightly argue that "[a]s a country with few indigenous energy resources, Japan has much to gain from a more integrated Asian energy

system providing flexibility, redundancy, multiple suppliers and more dynamic price signalling than that offered by multi-decade energy contracts with suppliers.” In other words, the bottom-line business aspects alone suggest the project would be attractive. Add to that the prospect for greater energy security through cooperation, reduced environmental destruction, and the opportunities to bring an often dangerously fractious region into closer contact. An Asian supergrid could indeed put real muscle on the as yet bare bones of Japanese PM Hatoyama Yukio’s vision of East Asia “fraternity.”<sup>44</sup>

### **Will Japan Become Number One (Again)?**

The Japanese case is indeed particularly interesting when it comes to energy policy and the ongoing revolution. Regime change via the election of the Democratic Party in September of 2009 brought in a new government formally committed to the use of robust feed-in tariffs and other policies to transform the energy sector and reduce carbon emissions. Japanese Prime Minister Yukio Hatoyama received international plaudits with his September, 2009 announcement that Japan would cut its carbon emissions by 25% (versus 1990 levels) by 2020. This target has now been institutionalized via Japan's commitment to it officially at the UN.

So on the surface we see common sense and commitment, especially in contrast to the previous Liberal Democratic Party regime. The problem with the Liberal Democrats was that they were representative of the status quo, an export-dependent economy wherein one of the main concerns was the cost of inputs. Since Japan has virtually no indigenous conventional energy resources,<sup>45</sup> its energy policy has long centered on getting the cheapest fuel possible to its producers. A major aspect of Japan's foreign policy, in addition, is maintaining access to overseas energy supplies. The alliance with the United States, now in its 50th year, is clearly underpinned in large measure

by the fact that America polices the sea lanes, allowing Japan to import oil, coal and other energy resources without having to field its own blue-water navy. In this respect, no one should forget that the Pacific war, with its attack on Pearl Harbour in 1941, was in large measure motivated by the need for secure supplies of energy. In that era, the Americans were the world’s Saudi Arabia, and had cut Japan off. The Japanese were then left to choose between abandoning imperial ambitions or going for the oilfields of Indonesia and elsewhere.

Japan lost the eventual war and came under Washington’s tutelage. The embrace of oil-age America was so tight that Japan saw little beyond it, and missed the German and Chinese successes with the FIT until Sharp and other producers had been pushed from the top of the world leagues. The reluctance of the Liberal Democratic Party, with its base in small business and heavy industry, to adopt FIT and other policies fostering renewables has also to be seen against the background of the collapse of the bubble. The shock of the bubble’s collapse in the early 1990s has not only rewritten the social contract in Japan but has also rendered the country extremely risk-averse. The corporate sector is dominated, via Keidanren and other bodies, by old-line industries whose sensitivity to costs cannot be underestimated. Note the example of Mitarai Fujio, Chairman and CEO of Canon, and head of Keidanren until the end of March. In 2000, Mitarai praised Japan's “unique” lifetime labour institutions,<sup>46</sup> but now presides over a firm that has among the country’s highest percentage of temporary employees.<sup>47</sup>

This point is not that Mitarai is a hypocrite, but rather that cost pressures are fierce. Because of this background, much of the Japanese elite has grown extremely cautious. The use of public policy to engineer transformative shifts in the political economy -- once the hallmark of Japan -- is now no longer its forte. As we have

seen, it is the Germans and others who are and continuing to innovate in transformative public policy.

Yet with regime change Japan has an explicit commitment to making its currently restricted feed-in tariff into a comprehensive one (covering all forms of renewable energy) that at least matches what we find in Germany. Recent statements coming from the Democratic Party government also suggests that we may see a commitment to raising the level of renewables in power production to 20% by 2020.

With new governance, Japan is at least back in the running to get at the head of the current energy transformation. The established ties between the executive class in big business, the bureaucrats, and the political class were greatly disrupted by the regime change in the 2009 general election. And business itself is shifting, as we see in Showa Shell's repositioning itself from being explicitly an oil company to an "energy company" invested in solar as well.

Yet a number of problems remain. Most salient is the regional monopolization of Japan's power production and distribution by the 10 electrical utilities. They naturally oppose a robust FIT and distributed power, fearing the loss of dominance. In addition to fixing the FIT (which currently only covers solar)<sup>48</sup> smart deregulation is needed here.

There are political problems as well. Among these is the fact that some of the elite inside the DPJ have trouble grasping the massive opportunity for Japan. Foremost among these people, it seems, is Ozawa Ichiro, currently the second-in-command of the party and in charge of its electoral strategy. He is also a strategist who maximizes opportunity in the here and now, meaning that he is inclined to sacrifice long-term objectives for short-term electoral gain. For example, he stresses handouts to the farmers in the rural sector in order to draw their support away from the LDP and other

contenders, rather than use policy innovation in order to foster business opportunities for those farmers (and other rural residents) and thus offer them the potential to learn income that far exceeds what they can expect in terms of price supports. Ozawa thus appears to be a detriment to real change.

Moreover, several of Ozawa's staff have been under arrest and continuing investigation for irregularities concerning political contributions. Support for the DPJ itself has slid sharply from its over 70% support last year. At least some of that decline must be from the Ozawa millstone, as recent polls suggest that over 70% of voters want him personally to resign. It seems time for the DPJ to ask whether Ozawa is a net benefit to the party, or simply a dead weight at a time when it needs to take constructive action.

An additional reason for the slippage in support is that the economic program of the Democrats remains unclear, to say the least. They have emphasized spending on people as opposed to things, which is a healthy shift away from the postwar political regime's emphasis on public works that were often quite wasteful. Yet what Japan needs right now is a robust policy regime that fosters domestic demand, upskilling, safety nets for workers (especially those in the massively expanding temporary worker category), and the other means to get out of the narrowing opportunities presented by dependence on exports. In the wake of the financial shock, global demand has not only shrunk; it also appears to be shifting towards cheaper products that are at least somewhat reliable (ie, consumers are sacrificing quality for cost). This puts Japan, especially one reeling from the so-called "Toyota shock" (which undermines the premium price for quality argument) at a serious disadvantage vis-à-vis its competitors who are stealing market share from many areas that used to be Japan's preserve. This loss of market share, as well as the threat of more, is evident in even special

product niches Japan has long dominated.

Yet in behind the confusion of the Ozawa issue, we see DPJ politicians from the rural areas very interested in transformative energy policy that promises to provide opportunities to their constituents. This is one sector of profound support for the comprehensive FIT and other mechanisms. Another sector is the Ministry of Foreign Affairs, which in fact has been leading the adoption of GHG targets and other bold initiatives.<sup>49</sup> Unfortunately, the Ministry's enthusiasm is not shared among other ministries, including the top leadership of the METI, the Environment Ministry, and elsewhere. Indeed, fully grasping the range of opportunities appears to be problematic in some of these ministries. Hence the unusual phenomenon of the Ministry of Foreign Affairs being extremely well-informed and active in the energy policymaking sphere, while the other agencies of the state remain in a sluggish mode. They are not generally against the targets and other policies so much as they are inclined to study them to exhaustion. This lassitude is in spite of the fact that we see such a rapid diffusion and continuing innovation in even once-laggard countries such as the UK.

However, the American economy is now dipping into what looks to be another round of decline driven by the exhaustion of the stimulus as well as the inability of its political class to reach any agreement in advance of the 2010 midterm elections. Hence one of Japan's export options is seemingly set to decline further. In addition, the Chinese government is not only seeking to cool off its own bubble - a source of external demand for Japan - but is also keen to maximize domestic benefits through the energy revolution and related areas. As for the Europeans, the only question is how bad their current crisis becomes as Greece and other countries approach the edge of fiscal default. With this increasingly foreboding external environment, Japan may find itself compelled to learn how to use the smart state very fast.

Given the country's history of catch up development, it will be a challenge to go beyond and pioneer even further than the Chinese and others. But the situational imperatives that Chalmers Johnson depicted in his masterful account of the reasons for industrial policy leadership via MITI have in large measure become even more pressing.

Link 1  
(<http://www.renewableenergyworld.com/rea/news/article/2009/09/feed-in-tariffs-go-global-policy-in-practice>)

Link 2  
([http://www.salon.com/news/us\\_economy/index.html?story=/opinion/feature/2010/01/04/new\\_economy](http://www.salon.com/news/us_economy/index.html?story=/opinion/feature/2010/01/04/new_economy))

Link 3  
([http://www.fitcoalition.com/research/supergid\\_smart\\_grid\\_cooperation](http://www.fitcoalition.com/research/supergid_smart_grid_cooperation))

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Notes

<sup>1</sup> Suntec's operations are global, but its

headquarters are in the Chinese city of Wuxi. Shi's comments are cited in the January 21, 2010 edition of *Cosmos* (<http://www.cosmosmagazine.com/node/3243/full>).

<sup>2</sup> Of course, the *Times* is yet again mistaking America as somehow representative of "the West." In fact, the Germans and other EU countries have long been using public policy to drive their energy revolutions. That is why Suntech's Shi praises (<http://www.cosmosmagazine.com/node/3243/full>) German government leadership in driving a "dramatic increase" in renewable demand.

<sup>3</sup> The January 21 2010 edition of *The Economist*, in an article titled "The Growth of the State: Leviathan Stirs Again," notes that the state's growth was evident prior to the current crises and is likely to be sustained because of the effects of ageing and etc on public budgets. Big states do not necessarily mean weak economies, as we have learned from Scandinavia and elsewhere. But that positive outcome depends on the quality of public policy and spending programmes.

<sup>4</sup> One of the foremost experts on this revolution is Martin Jaenicke of the Free University Berlin. A recent interview with him is available [here](http://www.magazine-deutschland.de/en/artikel-en/article/article/martin-jaenicke.html) (<http://www.magazine-deutschland.de/en/artikel-en/article/article/martin-jaenicke.html>). The main details of the German "3<sup>rd</sup> Industrial Revolution" can be found [here](http://www.magazine-deutschland.de/en/artikel-en/article/article/die-dritte-industrielle-revolution.html) (<http://www.magazine-deutschland.de/en/artikel-en/article/article/die-dritte-industrielle-revolution.html>).

<sup>5</sup> The internet is a USD 1 trillion business. But venture capitalist John Doerr, noting the Valley's shift to clean tech and the USD 6 trillion energy business, declares that "it could be renamed 'Solar Valley' in a decade." See December 21, 2009 *USA Today* (<http://www.usatoday.com/tech/news/2009-12-2>

[1-valley-green-solar-power\\_N.htm](http://www.usatoday.com/tech/news/2009-12-21-valley-green-solar-power_N.htm)).

<sup>6</sup> Even food: on average, it requires ten calories of petrochemical energy, used in fertilizers, power for irrigation, fuel for tractors, and the like, to produce one calorie of food.

<sup>7</sup> Bernaud Beaudreau, in his *Energy and the Rise and Fall of Political Economy* (2<sup>nd</sup> ed., xiv), points out that "[p]aradoxically, energy and energy-related innovations constitute the primary factor input in the first and second industrial revolutions, they are absent from contemporary political economy."

<sup>8</sup> And note the scale that the sector has already achieved. For example, the Renewables Global Status report for 2009 shows that global power from renewables rose 16% over 2007 to reach 280 gigawatts, three times the entire capacity of the US nuclear sector. Moreover, "[m]ore renewable energy than conventional power capacity was added in both the European Union and United States for the first time ever": [link](http://www.ren21.net/globalstatusreport/g2009.asp) (<http://www.ren21.net/globalstatusreport/g2009.asp>).

<sup>9</sup> In a further innovation on this policy's coverage of energy types, the UK Government announced on February 2 that its feed-in tariff (slated for introduction on April 1) will include "heat," as in the use of heat pumps for cooling and heating. The UK has long been a laggard in renewables policy and deployment, seeking to let the market lead rather than shape it, but now its stance has abruptly shifted. And the laggard is clearly using its advantage of backwardness, to innovate beyond what the leaders - such as Germany - have already institutionalized.

<sup>10</sup> With the singular exception of the Korean case, which not surprisingly has

<sup>11</sup> The report was released on September 14, 2009, and is available online [here](http://www.fitcoalition.com/storage/references/DBCCA_Creating_Jobs_and_Growth_The_Germ) ([http://www.fitcoalition.com/storage/references/DBCCA\\_Creating\\_Jobs\\_and\\_Growth\\_The\\_Germ](http://www.fitcoalition.com/storage/references/DBCCA_Creating_Jobs_and_Growth_The_Germ)



an\_Green\_Experience\_Sep\_2009.pdf).

<sup>12</sup> On the diffusion of the FIT, see “Renewables Global Status Report: 2009 Update,” Paris: REN21 Secretariat: link ([http://www.unep.fr/shared/docs/publications/RE\\_GSR\\_2009\\_Update.pdf](http://www.unep.fr/shared/docs/publications/RE_GSR_2009_Update.pdf)).

<sup>13</sup> At its January 17, 2010, conferences of member states, IRENA determined that in 2010 it “will set out to establish itself as the global base for renewable energy knowledge”: link ([http://www.irena.org/downloads/PrepCom/3rdPrepCom/Press\\_Release\\_3rd\\_Prep\\_Comm.pdf](http://www.irena.org/downloads/PrepCom/3rdPrepCom/Press_Release_3rd_Prep_Comm.pdf)).

<sup>14</sup> Ofgem is the Office of Gas and Electricity Markets. Link (<http://www.independent.co.uk/news/uk/home-news/ofgem-only-state-intervention-can-prevent-power-cuts-1889030.html>).

<sup>15</sup> As late as 2006, Morgan Stanley Research's Robert Feldman was warning that "derivatives are booming around the world. Japanese equities will lose competitiveness unless Japan adapts to global practices (link (<http://www.fsa.go.jp/frtc/20061205/02.pdf>)). Hindsight is of course 20-20, but note that at the time of the Feldman's powerpoint, Goldman Sachs was already starting to short the property bubble, forcing AIG - a true believer in the bubble and derivatives - to pony up more and more collateral until they ran dry and “Helicopter Ben” Bernanke's Federal Reserve Board flew in with the secret funds (“Maiden Lane III”). Now even Goldman Sachs representatives telling the US Financial Crisis Inquiry Commission that some restrictions on derivatives might be in order.

<sup>16</sup> On this, see the WTO's research ([http://www.wto.org/english/news\\_e/pres09\\_e/pr554\\_e.htm](http://www.wto.org/english/news_e/pres09_e/pr554_e.htm)) on global trade and *The Wall Street Journal's* calculations (<http://www.livemint.com/2009/07/22125235/World-exports-totaled-1578-t.html>).

<sup>17</sup> In its March 4, 1999, edition *The Economist*

wrote that oil was going to drop to USD 10/barrel and perhaps even USD 5/barrel. Then in its April 28, 2005 edition it wrote of oil supply as “the bottomless beer mug.”

<sup>18</sup> Seriously. In the Fall 2009 edition of *The International Economy*, Guy Sorman (“Japan's Road to Harmonious Decline”) writes of how “those lazy Japanese are goofing off again.”

<sup>19</sup> On February 5, the PEW Environment Group reported the results of its study quantifying the costs of Arctic melting. It estimates that the “climate cooling value” lost by the shrinking and thinning of the Arctic ice is already between USD 61 billion and USD 371 billion, and that these costs will rise to USD 2.4 trillion by 2050. Link ([http://www.pewtrusts.org/news\\_room\\_detail.aspx?id=57159](http://www.pewtrusts.org/news_room_detail.aspx?id=57159)).

<sup>20</sup> See, for example, see UCSD Professor James Hamilton's “Oil Prices and the Economic Downturn” at his home page (<http://weber.ucsd.edu/~jhamilto/#working>).

<sup>21</sup> America is poorly supplied with public transit. And that is especially true in the exurbs and other new communities where subprime lending was concentrated.

<sup>22</sup> Note that this “bottom” would have been seen as very high a decade ago.

<sup>23</sup> Since Goldman Sachs trades heavily in derivatives, its projection (which follows warnings from many far more reputable organizations) has the special force of a self-fulfilling prophecy: link (<http://www.bloomberg.com/apps/news?pid=20601082&sid=axnm2BeGMveI>).

<sup>24</sup> The September 14, 2008 *Oil and Gas* journal reports that gas and oil pipelines in the US alone total 544,000 kilometres. The infrastructure replacement and construction costs are in the USD millions range per kilometer.

<sup>25</sup> The report is in large part available here (<http://www.worldenergyoutlook.org/>).

<sup>26</sup> The Economist has long derided the “peak oil” debate, but in its December 10, 2009 edition cited the IEA Chief Economist Fatih Birol’s warning that conventional oil supplies were not likely to keep pace with demand: link ([http://www.economist.com/businessfinance/displaystory.cfm?story\\_id=15065719](http://www.economist.com/businessfinance/displaystory.cfm?story_id=15065719)). Birol’s warning was not new, as he has been pointing out the facts for a couple of years, but it took a while for The Economist to notice.

<sup>27</sup> On military spending, see this link (<http://www.globalissues.org/article/75/world-military-spending>).

<sup>28</sup> While the nuclear industry argues that it too is clean energy (due to very low greenhouse gas emissions), the health and environmental damage from uranium mining, transport, use and disposal appear, if anything, worse than many have thought. On these adverse effects of the industry, see the 2009 report “Human Health Implications of Uranium Mining and Nuclear Power”: link (<http://www.safewater.org/PDFS/reportlibrary/HumanHealthImplicationsUraniumNuclear.pdf>).

<sup>29</sup> See Lind’s remarks here ([http://www.salon.com/news/opinion/feature/2010/01/04/new\\_economy/](http://www.salon.com/news/opinion/feature/2010/01/04/new_economy/)).

<sup>30</sup> Of course, Saudi Arabia holds the world’s largest and low-cost oil reserves. A summary of the announcement is available here (<http://www.circleofblue.org/waternews/2010/world/saudi-arabia-to-use-solar-energy-for-desalination-plants/>).

<sup>30</sup> In hydro-electric dams, water runs from the reservoir through turbine blades to generate power. So “pumped-storage” of power is simply a matter of pumping water back into the reservoir. The technology dates from the 1890s, has an efficiency of about 70 to 85

percent, and already has 90 gigawatts of capacity (3 percent of global generation). See Electricity Storage Association ([http://www.electricitystorage.org/site/technologies/pumped\\_hydro/](http://www.electricitystorage.org/site/technologies/pumped_hydro/)).

<sup>31</sup> See “feed in tariffs go global,” renewable energy world: link (<http://www.renewableenergyworld.com/rea/news/article/2009/09/feed-in-tariffs-go-global-policy-in-practice>).

<sup>32</sup> On this, see the aggressive but also very perspicacious writings of Kevin Phillips, especially his 2007 work *American Theocracy*. Phillips details very well the embedded role of oil (and other fossil fuels, but particularly oil) in the current American political economy.

<sup>33</sup> Or as one astute observer recently put it, the contest may be between “consumer democracy” and “capable governance”: link ([http://www.huffingtonpost.com/nathan-gardels/china-vs-the-us-at-davos\\_b\\_439864.html](http://www.huffingtonpost.com/nathan-gardels/china-vs-the-us-at-davos_b_439864.html)).

<sup>34</sup> And note that this political community includes the center-right governments, who in fact adopted the early versions of the feed-in tariff in 1991 “in response to demands by members in rural southern Germany with access to small, disused hydropower plants.” See Paul Gipe’s excellent work on this and related issues: link (<http://www.wind-works.org/FeedLaws/EvolutionofFeed-inTariffs.html>).

<sup>35</sup> The book was published in October 2009 by Earthscan in the UK: link (<http://www.earthscan-usa.com/Books/BookDetail.aspx?productID=214747>).

<sup>36</sup> It may seem odd to describe renewable technologies as in their infancy, as wind and solar have been around for decades. But energy technologies take decades to refine. And as the basic outlines of thin-film solar, concentrated solar, hot-rock geothermal, wave power, and others get established and look increasingly

feasible, they attract increasing flows of capital and competition to cut costs. The FIT is thus helping to compress the time scale for energy transition, an extremely important objective considering the multiple crises we confront.

<sup>37</sup> And never underestimate the power of this incentive. The US Statue of Liberty nearly was not put in place due to strong opposition from *The New York Times* and other interests.

<sup>38</sup> See, for example, the September 13, 2009, PIPA/BBC poll (<http://www.worldpublicopinion.org/pipa/article/s/btglobalizationtradera/637.php>).

<sup>40</sup> Contrast this with how willing so many people are to put up with coal mines, coal-fired generating stations and the like in their local and regional communities. These facilities do enormous damage to the environment and public health, but provide some employment and are – more importantly – habituated to.

<sup>39</sup> Link (<http://www.desertec.org/>).

<sup>40</sup> Many enthusiasts of distributed power oppose these large-scale projects, apparently worried that they might detract from building local generating capacity and dispersed economic opportunities. But in an era when cooperation in reconfiguring globalization is breaking down (as seen most dispiritingly in Copenhagen), perhaps the benefits of cross-border cooperation give these international projects a special role.

<sup>41</sup> Link (<http://www.desertec-asia.com/content/ts-introduction.html>).

<sup>44</sup> One very important potential here is in helping to pull North Korea into the mix. As North Korea experts David Hippel and Peter Hayes argue, North Korea has plenty of renewable resources and developing them would likely help to further link that country's citizens with the outside world (link (<http://www.sciencemag.org/cgi/content/full/307/5707/207>)).

<sup>45</sup> This is true of oil and gas, less so with coal. Japan's has some reserves of coal, but location and quality make them uncompetitive with imports.

<sup>42</sup> Link (<http://www.cambridge.org/catalogue/catalogue.asp?isbn=9780521843706&ss=exc>).

<sup>43</sup> Link (<http://labornetjp.blogspot.com/2009/01/why-silent-mitarai-san-open-letter-at.html>).

<sup>48</sup> Its introduction last November 1 was a sign that the old LDP-led order had grasped how comparatively weak was Japan's hand in the global race. But the utilities, helped by METI myopia, managed to fight the design of the FIT into a comparatively small box for solar only. This, in a country with the world's third-best geothermal potential.

<sup>49</sup> One might wonder whether the MOFA's enthusiasm in this regard is at least partly driven by the threat from Washington's vested interests: the US foreign policy elite, especially the Clintonians, appear committed to destroying the Hatoyama Government through fusillades of op-eds that get amped up into missiles when they enter Japan's mediaspace.