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One of Japanese Prime Minister Hatoyama Yukio's first public acts, in September, was to propose a 25% cut in the country's carbon dioxide emissions by 2020, relative to 1990 levels.[1] This forthright declaration from Japan, long a laggard in dealing with climate change, captured world attention in the fraught lead-up to the December 7 to 12 Copenhagen meeting. The Obama people may yet fail to deliver, but unlike the Bushies they won't have a slavish Japan backing them up. Hatoyama's policy announcement has also earned the wrath of Japan's emissions-intensive industries, hitherto largely left to design their own voluntary agreements. They and their allies in the media and academe insist there is no hope for achieving such a cut without ruining the economy.

Yet these critics either deliberately or unknowingly overlook the fact that Germany has adopted even more stringent emissions targets, is making rapid progress towards achieving them by incentivist policies, and is making money while doing it.[2] Dealing with climate change and energy challenges does not mean the end of growth and a frenzied effort to minimize consumption. Far from it, as clean energy can mean even more robust economic growth and certainly more interesting and healthy lifestyles. But it requires policy changes that take us from subsidizing the costs of dirty, unsustainable energy to channeling our considerable creative energies to fostering green growth. As Al Gore often remarks, our challenge is less about changing lightbulbs than it is about changing laws. In particular, our challenge is to adopt policies that already have a proven record of shifting the energy economy, while both dramatically reducing emissions and fostering a robust growth sector. What are the prospects that Japan will, like much of the rest of the world, learn from the Germans and implement smart policies in this extraordinarily important area?

On the issue of smart policies in Japan, I have some good news and some bad news. First the good news: November 1 marked the start of a nationwide feed-in tariff system in Japan. The European Union Environmental Agency defines the feed-in tariff as "the price per unit of electricity that a utility or supplier has to pay for renewable electricity from private generators. The government regulates the tariff rate."[3] In other words, through the feed-in tariff the public sector (the national or a local government) determines extra rates of compensation, relative to conventional power, for electricity produced by renewable energy. The public authority then has electrical utilities pass those costs along to consumers. In concrete terms, the feed-in tariff generally provides substantial subsidies for solar and other emergent renewable technologies while providing less of a subsidy for such mature renewable technologies as wind power. One critical point to note is that the subsidization does not come from the public sector, but rather is imposed through the electricity bill paid by consumers of electrical power. The

policy device thus allows the costs of building sustainable energy industries to be spread among the vast majority of consumers, since virtually all residents in any developed and rapidly developing (eg, China) country consume electricity through the grid.

The feed-in tariff secures a number of important objectives in one simple package. First, it guarantees a long-term market to producers of renewable electricity. It therefore removes much of the uncertainty that generally stands as a hurdle to deploying these relatively new and very promising technologies. The policy also ratchets down the subsidization year by year (an aspect known as "degression"), which gives sustainable energy producers incentives to deploy and enhance their technology as rapidly as possible. And since the policy also spreads the cost widely and very thin, it avoids undue burdens on any particular interest group or region. Another positive aspect is that the state is not paying from its own coffers. So the policy avoids putting pressure on the public finances, a critical matter at a time when many countries, and most especially Japan, are confronting escalating fiscal stress.

Introducing a feed-in tariff is hardly innovative on Japan's part. Japan has joined about 50 other countries in a global movement that uses these incentivist policies to encourage the diffusion of sustainable energy. That, as I said, is the good news. But in this short piece, I want to examine the bad news: the continuing attack on the Japanese feed-in tariff as well as the system's multiple shortcomings due to continually incoming artillery from vested interests.

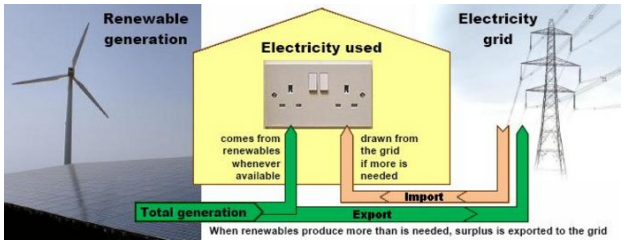
In Japan, as elsewhere, a host of objections have been raised against the renewable energy and the feed-in tariff. Opponents claim that the costs of the tariff are very high, that renewables are at best "boutique" energy sources, and so on. But most of these criticisms are as specious, misinformed, or outright fictions as the arguments against public health insurance that we hear from the US public debate over health-care reform. The fact is that feed-in tariffs and other policies are becoming standard policies for fostering the sustainable energy shift that is clearly essential to get out of the current recession as well as deal with climate change.

Indeed, on January 26 of 2009, a new international organization, the International Renewable Energy Association (IRENA) was set up with the aim of disseminating these new policy technologies. IRENA will soon boast 138 member countries, as of Mexico's October 7 announcement that it will join.[4] The foremost advocate of IRENA, lobbying for its institutionalization for over twenty years, is German parliamentarian Hermann Scheer. Scheer is an economist and head of the World Council for Renewable Energy. He is also one of the main architects of Germany's feed-in tariff. The tariff is at the core of the policies IRENA is advocating.

But IRENA isn't advocating feed-in tariffs simply because Scheer was instrumental in setting up the organization. It is, after all, an international organization that has grown to include 137 countries in under a year. IRENA advocates feed-in tariffs because they are the most effective policy tool for getting rapid deployment of renewables. The evidence is so overwhelming on this score that feed-in tariffs have rendered their competitor, quotas, extinct in the EU.

Moreover, the International Energy Agency looked at the evidence, and it too concluded that feed-in tariffs are essential. It bears keeping in mind that the IEA has hitherto been strikingly unsupportive of renewable energy because the agency largely represents the fossil-fuel and uranium industries. The IEA's institutionalized stubbornness against renewables is in fact one major reason that the

IRENA was set up. The IEA's budget reflects the minimal attention it gives to renewables, as it spends only USD 500,000 or so a year analyzing renewables (out of a budget of about USD 25 million). The agency's staff, especially at its higher levels, also largely comprises people who have substantial backgrounds in the fossil fuel industries.[5] Even so, the IEA bit the bullet and reported in its October, 2008 report on "Deploying Renewables"[6] that the feed-in tariff was the most effective of policies used to encourage the diffusion of sustainable energy.



More recently, the agency made an early release of the climate and energy scenarios for its "World Energy Outlook 2009" (link). The IEA argues that business as usual will lead to 1000 ppm in greenhouse gases by 2050. Though the IEA does not pursue the matter, 1000 ppm was last achieved in the terrestrial atmosphere about 40 million years ago, and the speed with which we are rushing towards this number gives credible climate scientists nightmares. The agency sketches an alternative scenario where we collectively cut back to 450 ppm (in itself a dangerous level[7]) by 2050 after spending a decade or so at a peak of about 510 ppm. To achieve this reduction, the IEA argues that between 2010 and 2030 we need over USD 6 trillion invested in new energy sources. And having recently brought in some experts who know what they're talking about concerning renewables, plus no doubt being chastened by the success of IRENA, the IEA now asserts that over 70% of that investment should be renewables. The IEA indeed urges a "much faster roll-out of renewables" than at present, and based on its work last year presumably would see feed-in tariffs as key to this end.

The point here is not that the IEA's projections are correct. They probably are not, particularly because the IEA is still compromised by the weight of vested interests in its ranks. The IEA has a long track record of underestimating growth in renewables, exaggerating oil reserves, and the like. It is also committed to nuclear energy and carbon-capture storage technology.[8] These sorts of problems with the IEA's perspective are legion, and give a good indication of how scrupulously its economistic staff sifted through the evidence in search of faults with sustainable energy policies, and especially with the feed-in tariff.

And when you have the IEA recognizing, very deliberately, definitively and publicly, that massive investment in renewables is essential, you know that you are in the midst of a sea change in the overall political economy of energy. Japan's adoption of a feed-in tariff is certainly to be applauded, as I said, but is just one more swirl in this enormous and accelerating shift towards clean, sustainable energy.[9]

Moreover, there are several problems with the feed-in tariff Japan has adopted. The first and most glaring problem is that the tariff applies almost solely to solar power. In fact, if you look at the PR materials (link) that the Ministry of Economy Trade and Industry has produced in order to publicize the tariff among Japanese consumers and businesses, the word "solar" is prominent (in Japanese, of course) whereas other renewables are not mentioned.

If Japan's potential renewable energy resources were limited to solar power alone, this kind of tightly focused, or restricted, tariff would make sense. But like almost all other countries, Japan enjoys fairly substantial shares of potential renewable energy resources in wind, geothermal, and other areas as well. This fact is denied by vested interests in Japan, which include in particular the electrical utilities that

own nuclear reactors and would like to own more. They have long claimed - with straight faces - that Japan has only limited wind, geothermal and other renewable resources.[10]

Country	CO_2 emission, million tonnes	Electricity consumption, TWh	Potential wind energy, TWh	
			Onshore	Offshore
U.S.	5,956.98	3,815.9	74,000	14,000
China	5,607.09	2,398.5	39,000	4,600
Russia	1,696.00	779.6	120,000	23,000
Japan	1,230.36	974.1	570	2,700
India	1,165.72	488.8	2,900	1,100
Germany	844.17	545.7	3,200	940
Canada	631.26	540.5	78,000	21,000
U.K.	577.17	348.6	4,400	6,200
S. Korea	499.63	352.2	130	990
Italy	466.64	307.5	250	160

International Comparison on emissions, energy use and potential

Among other very credible organizations, the Japanese Geothermal Academic Association clearly does not agree with these kinds of assertions. It posted an open letter, critical of the restricted feed-in tariff, on its website on October 5. The Association's open letter not only argues that Japan should be developing its geothermal resources; it also takes direct aim at the vested interests in METI and elsewhere that are blocking a move towards renewables even as they criticize the proposal for a 25% cut by 2020.[11]

But these kinds of groundless and clearly biased arguments are standard practice anywhere when it comes to renewable energies.[12] We are in the midst of an energy shift, and that means incumbent interests are desperately fighting to preserve market share. That is why, for instance, one regularly reads that wind turbines are responsible for the deaths of untold numbers of birds as well as the cause of curious health problems among residents who live near wind turbines.[13] But of course, bird strikes on wind turbines are vastly exaggerated by this sort of rhetoric. As the US National Research Council pointed out in a 2007 study, turbines were responsible for fewer than 0.003% of the anthropogenic bird deaths it surveyed.[14] Bird deaths from wind turbines is a small drop in a very wide ocean composed mostly of birds sacrificed to tall buildings, window glass, cats, and the environmental destruction brought about through current energy development and consumption.

Against these kinds of questionable assertions, consider that in the US alone consuming fossil fuels cost (in 2005) about USD 120 billion per year in damage to public health. This enormous sum is what the US National Academy of Sciences found when its National Research Council examined the matterthe external cost of using fossil fuels to generate power, move automobiles, and the like. That means the cost was not included in the price of the fuels, and is instead paid by the individual victims of diseases as well as the larger society. Moreover, the cost calculations did not include damages from climate change, harm to the ecology, national security risks (through relying on often unstable regimes for oil and natural gas), as well as the effects of several air pollutants including mercury.[15]

And then add to that the fact that the UE Environmental Law Institute (ELI) recently determined that subsidies for the US fossil fuel industry – generally via tax breaks – amounted to USD 72 billion from 2002 to 2008, versus USD 29 billion for renewables over the same period.[16]

Japan does not have data comparable to the above, which is itself reliant on the EU's pathbreaking research on externalities via the "ExternE" Project (link). But we do know that among Japan's YEN 7.35 trillion in central government tax breaks for various purposes, fully YEN 3.6 trillion are eaten up by a subsidy for the purchase of naptha. And given Japan's relatively dense population, the health costs of fossil fuels are perhaps roughly comparable to that seen in the US (adjusting for population size and other relevant factors).

So the question is: with all these health and other costs as well as the potential to reduce them, why restrict the tariff to solar? The key issue in the Japanese case is that the bureaucracy in METI and NEDO see nuclear as Japan's best bet, in spite of all its costs and risks, and work to obstruct other options. The head of the METI Agency for Natural Resources and Energy made this clear when he claimed that nuclear power was all Japan needs in the way of "renewables."[17] But they are fighting in the face of a sea change on energy, as we have seen, so they are also forced to give ground bit by bit. Solar power was long a pet project in METI's predecessor, MITI, and hence had the institutional backing when a government feed-in tariff finally came on the agenda.[18]

The electrical utilities, of course, remain desperate to limit any competing energy industries as much as possible. Their fossil-fuel fired plants and their nuclear stations are wired into a grid they control in 10 separate regional monopolies, and they simply want no real change to this arrangement. The October 19 Nikkei newspaper, for example, quoted the head of the electrical utilities' pressure group (and CEO of Kansai Electricity), who made it clear that the utilities would do everything to restrict the nationwide feed-in tariff. That means trying to keep the door closed to anything other than solar, as well as keeping a smart grid (which would be a boon for renewables) off the agenda unless they control it.

Japan's utilities argue that the feed-in tariff will increase consumer prices to levels that will make the utilities subject to complaints from consumers. But this is absurd, as even in extreme scenarios of uptake of solar power, the average monthly surcharge is projected at YEN 100, or about one US dollar. The public has endured considerable increases in electrical utility costs due to escalating fossil-fuel prices (largely coal and natural gas) since special fuel adjustment measures were introduced in calculating electricity bills in 1996. It seems very likely that the Japanese public would embrace measures used to fund renewable energy, whose fuel costs are free and whose technologies are a booming market around the world.[19]

For a vision of the allegedly onerous future, look at Germany, where the comprehensive and robust feed-in tariff has seen renewably generated (ie, solar, wind, and others) electricity increase from 6.7% of the total in 2001 to 14.2% of the total in 2007 (the most recent data). The surcharge in Germany is only about three euros, or yen 400 (about USD 3.5), per month. Moreover, the Germans have been so successful in fostering sustainable energy industries that Germany's Energy Consumer Organization is actually supportive of the feed-in tariff and does not want to see it cut back. Indeed, in the wake of the September 27 election in Germany it has become clear that the new coalition remains committed to maintaining the feed-in tariff.[20]

Let me repeat that the critical difference between the feed-in tariff that one finds in Germany (as well as India, Canada's province of Ontario, South Africa, and elsewhere) and the one now in effect in Japan is that the former are comprehensive whereas Japan's is restricted. Comprehensive means that all

energy sources are covered by the tariff, including solar as well as wind, geothermal, biomass, and other energy sources. This diversity of energy sources is critical for encouraging competition among emergent industries as well as providing economic growth and employment opportunities among the local areas in a given district covered by a feed-in tariff. For example, some areas may enjoy a bounty of solar resources whereas others have a great deal of wind resources but not appreciable solar. Other areas might lack both solar and wind, but have an abundance of biomass. And other areas may be ideal for geothermal or marine production of electricity. A comprehensive feed-in tariff allows all of these areas to exploit their given sustainable energy resources. A restricted feed in tariff does not.

Japan's adoption of a restricted feed-in tariff is explicable when one looks at the politics involved. But considering the country's challenges, it's a bizarre case of parasitism by the utilities and their supporters in the bureaucracy and elsewhere. Consider the business opportunities that these vested interests are seeking to stymie. And then recall that Japan confronts the industrialized world's worst public debt problem as well as its most sobering economic challenges. Japan's public debt for fiscal 2010 is projected to increase by YEN 44 trillion or thereabouts, as the general budget is virtually certain to exceed YEN 90 trillion but be supported by less than YEN 40 trillion in tax revenue. Japan's local governments, with the exception of Tokyo and a few other stronger jurisdictions, confront equally or even more dire fiscal scenarios.

The numbers are nothing short of awesome. Japan as a whole has an accumulated public debt of just under 200% of GDP, having blown through the 100% barrier in 1997. By comparison, the average public debt load among the OECD countries in 2007 was about 75% of GDP. This means that Japan is moving towards well over twice the average debt load in the OECD. In fact, Japan may be headed towards 250% of GDP by April of next year, thanks to stimulus spending plus the yawning budget deficit due to an economy still shrinking at about a 6% clip. The point is not that Japan has to start cutting its budget or raising taxes right away, as that would invite a plunge into a deeper recession than we saw earlier this year. But it certainly seems clear that Japan needs to foster growth sectors in its economy, in order to maintain its standard of living as well as allow it to pay down the debt.

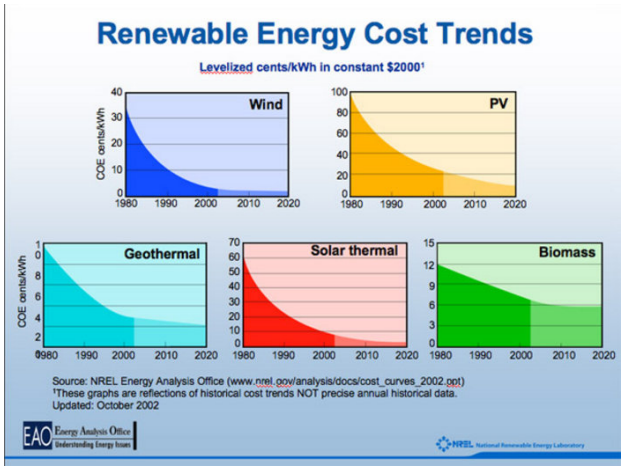
The question immediately arises whether renewable energy actually provides the kind of growth sector that might help Japan escape from its looming debt trap. The anti-renewable rhetoric would have us believe that renewables are an expensive avenue that will only hobble the economy in the midst of increasingly fierce competition over dwindling export markets (and yes, global exports are still shrinking). Here again, it's useful to look at the German case. Recent work on Germany has shown that the country is the leader of the third Industrial Revolution. Surveys of the German green economy show that in 2007 it already represented 6% of GDP, and that it is expected to grow to 14% by 2020. If this projection is accurate, the German green industry will overtake automobiles and all other industrial sectors and become the biggest industry in Germany as well as the most potent creator of jobs. And note that the work on Germany does not come from such suspect organizations as Greenpeace and others who are often seen as having an agenda. Rather, these studies are produced by such hardheaded agencies as Roland Berger and Associates, a well-known consultant organization in Europe and throughout the world.[21]

But why restrict the lens to Germany alone? China is another booming green economy, and the China Greentech Initiative (a research group composed of 80 firms and other

organizations, including Price Waterhouse Coopers, indicates that the Chinese economy's green sectors will grow to 15% of GDP by 2013 (link). Chinese producers have driven down the cost of solar panels by 20 to 30 percent in 2009 alone. And as has become apparent, China is advancing so rapidly in wind that it will very soon overtake all other countries, including the United States. Note that China has a comprehensive feed-in tariff. Note also that it did not even have a wind industry to speak of five years ago.

Another problem with the Japanese feed-in tariff is that it only guarantees a 10-year market for production and only covers access production over household consumption. The 10-year guarantee is half of what the vast majority of comprehensive feed-in tariffs provide. The need to provide a long-term guarantee stems from the cost of installing the technology and the duration needed to recoup the investment. Comprehensive feed-in tariffs generally offer 20 year guarantees, and sometimes even longer, because that is a robust incentive for installation. Note that these comprehensive systems do not simply guarantee the market and leave matters at that. As noted earlier, they also incorporate regular reductions of the tariff (via degression) in order to encourage technological progress.

These policies for fostering an energy shift are extremely advanced and becoming the key devices for constructing markets. Hitherto, we have largely been complacent and left renewable energy off the table in discussions of economic development, the new economy, the knowledge economy, and the like. Even so, renewables have been sprinting down the cost curves (see chart). With the power of the public sector in play, shaping markets, there is almost certain to be an even more rapid decline in unit costs (and cost per kilowatt-hour generated) as well as technological progress rivaling the internet. This is the kind of policy shift that is now underway, and Japan would be well advised to get in front of the curve rather than straggle along.



Perhaps the main problem with having the restricted feed-in tariff policy implemented now in Japan is that it likely sets the agenda for any future energy markets in Japan. That is to say, once the policy has been enacted it becomes very difficult to amend. That doesn't mean that revisions will be impossible, but significant amendment is likely to require some sort of crisis because the vested interests standing in the way of the policy are forced to back down. A two-year study committee has been struck in METI to examine expanding the feed-in tariff. The DPJ appears committed to bringing wind, geothermal and other renewable resources into the tariff, but the utility unions are among its largest supporters. Any revision to the policy now in effect is likely to come only with a hard fight among the politicians themselves as well as between them and the bureaucracy/business nexus in this area.

Even if common sense wins out and a comprehensive tariff is adopted, the wasted time will likely be deeply regretted. Keep in mind that in 2005 Japan had half the world's solar production, whereas that share had dropped to about 10% in 2008 once the Germans, Americans and Chinese ripped past. Time itself is a precious commodity when it comes to seizing opportunities in an industrial

revolution.

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Notes

[1] On June 10 of 2009, former PM Aso Taro had formally committed Japan to a 15% cut – versus 2005 emissions levels – by 2020, a target that was effectively a mere 8% cut from 1990 levels, and thus widely ridiculed.

[2] The November 2009 edition of "Wedge," a Japanese-language business magazine carries a "special report" that essentially brands Hatoyama's commitment as economic lunacy. But though the articles in the special are written by such luminaries as former METI bureaucrat (and now senior fellow at the 21st Century Public Policy Institute) Sawa Akihiro, they deploy tendentious economic models and ignore the facts on Germany. A previous and translated anti-Hatoyama piece by Sawa, one that also ignores German successes and other realities, can be found here.

[3] The World Future Council which "regards the feed-in tariff as the most effective available policy to increase the deployment of renewable energy," has a concise summary of feed-in tariffs and their effects here.

[4] Japan became a member soon after the US and others announced their intention of joining. Americans should be interested in Mexico's announcement, since Mexico their third major oil supplier, is likely to lose the capacity to export in a few years. Without a robust green-growth sector in Mexico, Americans will not only have no oil from that country, but the prospect of even more chaos extending across their border. Such are the realities in the sunset of the oil age.

[5] Link

[6] The report is available here.

[7] The real target apparently ought to be 350 ppm, according to an increasingly persuasive argument. On the background to the debate see this link.

[8] The latter is a technology for removing CO2 from coal combustion and then injecting the trapped gas into underground storage. It is not deployable at present, and may not be until at least 2020. It is also a "fata morgana" according to Helene Pelosse, director general of IRENA (link).

[9] For comprehensive figures on renewable energy trends, see this link.

[10] In fact, Japan has ample wind and geothermal resources, but lacks robust policy incentives for deployment and further technological advances: link.

[11] The open letter is here.

[12] Beyond the influence of vested interests, there appears to be a psychology that opposes any sort of change. Note, for example, that in the 1880s the Statue of Liberty was resolutely opposed by many interests in New York, including *The New York Times*: link.

[13] On the alleged health problems, the Chief Medical Officer of Health for the Province of Ontario (Canada) is definitive: beyond anecdotal reports, "there is no scientific evidence, to date, to demonstrate a causal association between wind turbine noise and adverse health effects" (link).

[14] Link

[15] A press release describing the report as well as how it may be obtained is here.

[16] Contrast that figure with a paltry USD 29 billion for renewables over the same period. The report is available here.

[17] See Iida Tetsunari, "The Japanese Green New Deal," in *Sekai*, May 2009 [in Japanese].

[18] Back in the 1990s, the utilities had sought to

deflect pressures for a robust feed-in tariff by setting up their own, adopted in 1992, one hemmed in with all kinds of restrictions. On these pressures, see Saijo (2002)

[19] METI's own 2009 white paper on energy shows that escalating fuel costs as a driver of higher electricity costs is prominent among consumer's concerns (see the chart 112-2-9)

[20] On the German developments, see this link.

[21] Link