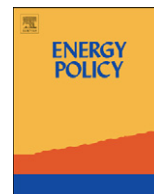




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Empowered? Evaluating Japan's national energy strategy under the DPJ administration

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ABSTRACT

In August 2009, after 54 years of virtually unbroken rule, Japan's Liberal Democratic Party (LDP) was ousted from power by the Democratic Party of Japan (DPJ). The DPJ's campaign platform included a pledge to facilitate extreme reductions in greenhouse gas (GHG) emissions. Yet, at the COP16 meeting in Cancun, Japan announced that it would not accept further emission reduction targets without broader commitment from all nations. This paper seeks to explain this dichotomy by employing a targeted stakeholder evaluation based on surveys with 321 Japanese citizens to assess the extent to which influential stakeholder groups in Japan supports a potentially costly transition to a low-carbon energy infrastructure amidst severe economic challenges that the nation faces. Findings help explain Japan's adversarial role in COP16 negotiations in Cancun, despite the stated GHG reduction ambitions of Japan's current ruling party. The analysis concludes that if the DPJ does embrace aggressive CO₂ reduction targets in the future, the strategic focus will likely mirror the former ruling party's energy policy of bolstering nuclear power generation capacity and promoting energy efficiency improvements while exhibiting lukewarm commitment to supporting capacity development in alternative sources of energy supply such as solar panels and wind turbines.

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1. Introduction

“Market movers”—this is the name given to major consumers or producers of commodities that have the power to significantly influence supply and demand conditions. In the global energy market, Japan is a market mover. It ranks third in the world in oil consumption, third in the world in nuclear power generation and fourth in the world in natural gas consumption (Valentine, *in press-a*). In aggregate, this nation of 127 million people (less than 2% of the global population) annually consumes over 5% of the world's annual energy supply (IEA, 2008b). Consequently, what Japanese policy makers decide to do in terms of energy planning is a matter of considerable interest to anyone who wishes to understand the evolution of global energy markets in coming decades.

There is another aspect of energy governance in which Japan should be considered a potential “market mover”—climate change negotiations. Japan established itself as a climate change policy force when it volunteered to host the 3rd Conference of the Parties (COP3) to the United Nations Framework Convention on

Climate Change (UNFCCC) in December 1997. It was at this conference that the Kyoto Protocol was adopted. Perhaps more importantly, Japan is a potential market mover in climate change negotiations because it has the power to significantly contribute to mitigation efforts. In 2009, Japan generated 1.6 billion metric tons of CO₂ emissions, representing 5.1% of aggregate global CO₂ emissions, the fifth most of all nations (Olivier and Peters, 2010). To put this total into perspective, Japan's CO₂ emissions in 2009 exceeded all annual GHG reduction commitments made by Annex I parties under the first commitment period (2002–2012) of the Kyoto Protocol. At such high levels of CO₂ discharge, decisions that Japan makes in regard to its energy mix can significantly influence global CO₂ emissions and sway policies of other nations.

Due to Japan's power to move markets in terms of global energy and climate change negotiations, the declaration by Japan at the 16th Conference of the Parties to the UNFCCC (COP16) that it would not accept further GHG emission reduction targets without broader participation from both developed and developing nations represents an enormous set back to attempts to extend the Kyoto Protocol to a second round of emission reduction targets (Black, 2010). In order to understand how this sea change in climate change policy came about, it is necessary to understand the trajectory of energy policy development in Japan.

Up to 2009, predicting the path of Japan's energy strategy was relatively straight-forward. Except for an 11-month period in

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1993/94, the nation had been governed by one political party (the Liberal Democratic Party (LDP)) since 1955. As a result, national energy policy progressed along a highly predictable track except for rare periods when exogenous global shocks (such as the oil supply shocks of the 1970s) forced the government to revise its strategy.

In the national elections of August 2009, the Democratic Party of Japan (DPJ) led by Yukio Hatoyama unseated the LDP as ruling party, giving rise to a higher degree of uncertainty over the future Japanese energy strategy. The DPJ campaigned on a platform which included a pledge of aggressive greenhouse gas (GHG) emission policies. However, in the year since the DPJ came to power, the Prime Minister has already changed once and the government finds itself mired in a search for solutions to deflation, stagnant economic growth and escalating fiscal deficits.²

Given this backdrop, one of the main goals of this paper is to conflate the DPJ's campaign promise for a more proactive approach to GHG emission reductions with the recent announcement by Japan at COP16 to reject further international commitments until nations like China, India and the US accept similar targets. The paper approaches this challenge in the following manner. Section 2 outlines Japan's energy profile with an emphasis on identifying energy supply trends. This section also summarizes the national energy strategy under the former ruling party (the LDP) in order to explain what is driving energy supply trends. Section 3 contrasts the stated position of the new ruling party (the DPJ) with the previous administration's energy strategy and examines the current economic realities that might impair the government's ability to enact energy reforms. It concludes with a contention that the DPJ will be hard pressed to deliver on its aggressive GHG reduction campaign promises without widespread willingness on the part of voters, industry and other influential stakeholders to accept higher energy costs and place such a transition ahead of other investment priorities. Therefore, an analysis of influential stakeholder perspectives is seen as a requisite step in predicting DPJ energy strategy. Consequently, Section 4 establishes the methodological parameters for evaluating, through primary research, the extent to which influential stakeholder perspectives in regard to energy policy diverge in Japan. Section 5 presents the findings from 321 surveys conducted in Japan to assess influential stakeholder perspectives on energy security and evaluates the extent to which divergence of perspective exists. Finally, Section 6 puts forth the rationale for a conclusion that divergence between current policy and influential stakeholder energy security expectations is not significant enough to provide the DPJ with the public and political support necessary to carry costly GHG reduction policies forward and this has been reflected in Japan's negotiation stance exhibited in Cancun whereby it refused to accept deeper GHG emission reduction targets without broader participation from all major nations that were party to the Kyoto Protocol (Black, 2010).

2. Energy and energy policy in Japan: a historical perspective

Japan is the most vulnerable of all OECD nations in terms of energy supply security. In 2009, it imported 96% of its primary energy supply. Notably in terms of risk exposure, oil still accounts for nearly 50% of Japan's primary energy consumption and the vast majority of its oil supply (90%) comes from the politically unstable Middle East region (FEPC, 2010).

The precarious position Japan faces in terms of supply security represents an ongoing problem. Since the oil supply shocks of the

1970s, Japanese energy planners have been endeavoring to alter Japan's energy mix to favor less reliance on oil, which in 1973 represented 77% of the energy mix (ANRE, 2006). Over the ensuing four decades, the guiding principle for energy policy has basically been to try and enhance capacity in technologies that provide affordable and stable supplies of energy in order to ensure that the competitiveness of Japan's energy intensive industries were not adversely affected (Valentine, in press-a).

As Fig. 1 illustrates, the result has been an increased reliance on coal, gas and nuclear power. Going forward, International Energy Agency (IEA) analysis of Japanese policy suggests that CO₂ abatement pressures will result in coal joining oil as energy sources falling into disfavor in Japan while natural gas and nuclear power are expected to take up the slack (IEA, 2008c).

Someone with an interest in Japanese industrial development may find it curious that Japan chose to embrace nuclear power and natural gas as the technological platforms to replace oil and coal. After all, Japan has for years been a world leader in solar photovoltaic technology development (NEDO, 2006) and three of its conglomerates (Mitsubishi, Hitachi and Toshiba) are major players in the global wind turbine manufacturing sector (Valentine and Sovacool, in press). This begs the question, "Why has Japan de-emphasized support of wind and solar power development for electricity provision and instead emphasized capacity expansion in nuclear power and gas—two technologies which still require importation of fuel stocks?" The answer to this minor ambiguity rests with an examination of aggregate demand for electricity in Japan.

Since 1975, electricity demand in Japan has increased from 349.0 terawatt hours (TWh) to 888.9 TWh in 2008 (FEPC, 2010), ranking it third in the world in terms of aggregate electricity consumption (CIA, 2009). This escalation in demand necessitated electricity supply capacity expansion efforts of vast scale and had the effect of focusing efforts on large-scale utility expansion projects (predominantly nuclear plants). Wind power was largely derogated due to concerns (albeit often over-exaggerated) over inadequacy of the technology (in early years), procuring sufficient quantities of high quality wind sites and utility resistance stemming from concerns over management of stochastic power flows (Englander, 2008; Ushiyama, 1999b). Solar power was largely disregarded for utility-scale energy provision because of cost concerns (Ushiyama, 1999a). Conversely, nuclear power technology was seen as an internationally marketable commodity that could also provide Japan with a global technical advantage in energy generation (Valentine and Sovacool, in press). It is for this reason that Japan has invested over US\$70 billion in nuclear power research over the past three decades and nuclear power has come to play such an influential role in Japanese energy policy

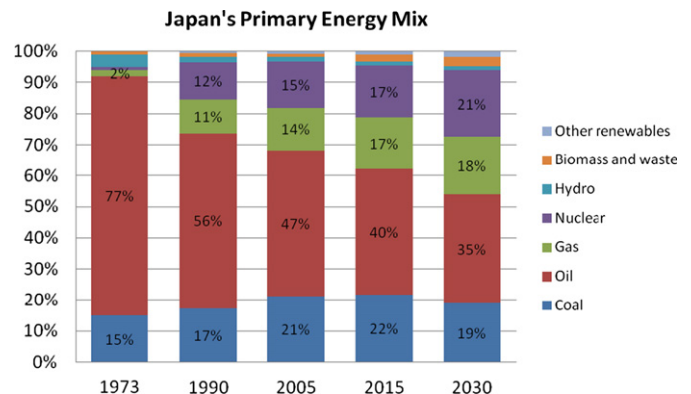


Fig. 1. Trends in Japan's primary energy supply. Source: IEA, 2008a; ANRE, 2006.

² Source: CNN <http://edition.cnn.com/2010/WORLD/asiapcf/09/09/japan.prime.minister.revoluting.door/?hpt=C1#fbid=3HY2i9LHsA5&wom=false>. Accessed September 13, 2010.

despite historically rooted social sensitivities toward nuclear technology (Valentine, in press-a).

In 2006, the ruling LDP released its *New Energy Strategy* which set forth five primary goals to be achieved by 2030. The goals essentially represented an extension of previous initiatives and included (i) improving energy efficiency by at least 30%, (ii) reducing overall oil dependence by 40% or lower, (iii) reducing oil dependence in the transport sector to 80%, (iv) targeting the share of nuclear power in electricity generation to 30–40% and (v) increasing the share of crude oil owned by Japanese companies to 40% (Amari, 2006).

In June 2008, Prime Minister Yasuo Fukuda announced a series of environmental initiatives that came to be known as the “Fukuda Vision”. The Fukuda Vision entailed a medium-term goal of reducing greenhouse gas (GHG) emissions to 86% of 2005 levels by 2020, which was to be partially achieved by ensuring 50% of all electricity generated by 2020 came from non-CO₂ emitting technologies (mostly hydropower and nuclear power). The vision also included a long-term target of reducing GHG emissions to 20–40% of 2005 levels by 2050 (Takase and Suzuki, in press).

On the heels of Fukuda’s surprise resignation just three months after announcing his “vision”, the LDP colleague who succeeded him as Prime Minister (Taro Aso) demonstrated the consistency that is characteristic of LDP policy by announcing a similar plan to reduce GHG emissions to 85% of 2005 levels by 2020. Many experts at the time, felt that the medium-term CO₂ reduction targets announced by both Fukuda and Aso represented pragmatic targets given the nuclear power expansion plans and the energy efficiency initiatives signaled by the *New Energy Strategy*; however, the targets were heavily criticized internationally as being an insufficient contribution to climate change abatement (Ramesh, 2009).

3. Political turbulence

In 2009, the smooth trajectory that Japanese energy policy had been progressing along hit a rough patch, which merits description because this path altering development provides the contextual basis for the research undertaken in this paper. In the August 2009 national elections, the Democratic Party of Japan (DPJ) unseated the LDP which had held power in Japan for all but 11 months since 1955. The DPJ was established in 1998 as a merger between four previously independent parties (the Democratic Party of Japan, the Good Governance Party, the New Fraternity Party and the Democratic Reform Party) in order to challenge the political lock the LDP had on Japan governance. To consolidate ideologies, the DPJ created a constitution which aimed to achieve the following five objectives, implying that a transition away from the cronyism attributed to LDP politics was impending³:

First of all, we shall build a society governed with transparent, just, and fair rules. Secondly, while the free market should permeate economic life, we aim for an inclusive society which guarantees security, safety, and fair and equal opportunity for each individual. Thirdly, we shall devolve the centralized government powers to citizens, markets, and to local governments, and build a decentralized society in which people of all backgrounds participate. Fourthly, we shall embody the fundamental principles of the Constitution: popular sovereignty, respect for fundamental human rights, and pacifism. Finally, as a member of the global community, we shall establish international relations in the

fraternal spirit of self-reliance and mutual coexistence, and thereby restore the world’s trust in Japan.

In September 2009, three months prior to the UNFCCC COP15 Conference in Copenhagen where round two (2012 and beyond) GHG reduction targets were slated to be negotiated, the new DPJ administration under the leadership of Prime Minister Yukio Hatoyama reaffirmed a campaign pledge that if a global agreement could be reached on reduction commitments beyond the first commitment period covered by the Kyoto Protocol, Japan would commit to a target of reducing national GHG emissions to 75% of 1990 levels by 2020. Major business lobby groups in Japan sharply criticized this policy as “unrealistic” arguing that the policy “will place Japan at a competitive disadvantage as the nation’s firms move overseas in search of less-stringent environmental regulations, (ultimately exacting) a heavy financial toll on both businesses and households.”⁴ Although the COP15 Conference in Copenhagen did not result in agreed second round targets, the conference concluded with the signing of the Copenhagen Accord which Japan signed. Although the accord is not legally binding, Japan recommitted itself to the DPJ’s target of reducing emissions to 75% of 1990 levels by 2020.

In June 2010, a mere nine-months into power and well before the performance of the Hatoyama administration could be adequately evaluated in terms of achieving these GHG emission reduction goals, a scandal over alleged misappropriation of campaign funds along with mounting public disfavor over *inter alia* a failure to keep a campaign pledge to close an American military base on the island of Okinawa encouraged Hatoyama to step down as party leader (and Prime Minister of Japan).

Hatoyama’s Deputy PM, Naoto Kan was elected by the DPJ to replace Hatoyama as party leader and thereby assumed the office of Prime Minister in June 2010. On June 13, in his first speech to the National Diet, Prime Minister Kan inferred continued support for the 2020 GHG reduction target set forth by his predecessor by linking the policy to broader “green innovation” economic growth initiatives.⁵ However, initiatives to achieve the 2020 target have yet to be fully explicated. The current DPJ energy policy is ambiguously described by the party as seeking to encourage improvements in energy usage efficiency and achieve a best-mix in energy supply that includes a safe level of nuclear power as well as proactive support for new energy technologies.⁶ In some respects, this decision to support Hatoyama’s campaign pledges reflects a desire on the part of the DPJ to project themselves to the voting public as a cohesive group following disruptive scandals involving Hatoyama and former party President Ichiro Ozawa.

Currently, Japan faces some deep seated social and fiscal challenges that the government is wrestling to overcome. On the social front, it is a rapidly aging society with over 21% of the population now 65 years or older and expectations for that figure to reach 35% by 2055 (Oe, 2005). This phenomenon has significantly increased the costs of providing health and social welfare services (Fujimura, 2009). Meanwhile, at the other end of the demographic spectrum, the birthrate has plummeted from 4.12 in 1940 to 2.0 in 1960 to 1.26 in 2005 (Fujimura, 2009). In concert, these two trends have sired a situation whereby Japan’s tax base has not grown sufficiently to cover fiscal outlays.

⁴ Source: Johnson, Eric. “Target CO₂ cut draws business ire”, Japan Times, September 9, 2009. Accessed September 14, 2010 at <http://search.japantimes.co.jp/rss/nn20090909a4.html>.

⁵ An English translation of this speech can be found at the Japanese Times website at <http://search.japantimes.co.jp/cgi-bin/nn20100613f1.html>.

⁶ Source: DPJ Website accessed September 9, 2010 at http://www.dpj.or.jp/policy/rinen_seisaku/seisaku.html.

³ Taken from the Democratic Party of Japan website: http://www.dpj.or.jp/english/about_us/philosophy.html. Accessed December 27, 2010.

To compound matters, Japanese economic output has been adversely affected by stagnant global markets and this has culminated in the worst recession in the post-war era, with output contracting approximately 6% in 2009. In order to stimulate demand, the government has implemented a series of stimulus packages since August 2008 and these pump priming initiatives have culminated in a fiscal deficit for 2010 that is expected to surpass 10% of total GDP and increase the total public debt to GDP ratio to 200% (OECD, 2009). By way of comparison, the public debt to GDP ratio in Greece prior to its financial meltdown was just below 120%.⁷ Overall then, it appears to be intuitively obvious that for the DPJ to avoid further erosion of Japan's fiscal health, fiscal expenditures of all types need to be carefully scrutinized, presumably with programs that have positive economic payoffs being given funding priority.

There is of course one significant exception to this pragmatic economic assessment of where the DPJ's policy priorities ought to lie. The turmoil and public disfavor associated with Hatoyama's time in power has adversely affected public support for the DPJ, with public approval ratings plummeting from 70% at the time that the DPJ came to power to 20% in June 2010 when Hatoyama resigned.⁸ Accordingly, there is a degree of pressure on the Kan Administration to be seen as serving the public will, even if there are financial costs associated with pandering to voter sentiments because failure to lift public approval ratings portends a short reign of power for the DPJ.

In 2009, a survey conducted by the Danish Board of Technology on "World Wide Views on Global Warming" revealed that 81% of Japanese respondents surveyed viewed climate change as an urgent issue and 70% supported a 25–40% cut in Japanese CO₂ emissions (based on an unspecified year).⁹ Although one may be tempted to conclude from such statistics that there is enough public support to mandate a change in policy direction in favor of the DPJ targets, the truth is that such assumptions cannot be made without better understanding the complete set of expectations that voters have in terms of energy policy goals.

Moreover, the survey mentioned in the previous paragraph was conducted well over a year ago and the Japanese economy has spiraled downward since then, forcing another round of costly stimulus measures, including reducing the Bank of Japan's prime lending rate to near zero. Consequently, understanding the current expectations of Japanese citizens (in particular, influential stakeholder groups) in regard to energy policy goals can shed light on the political merits associated with undertaking the investment necessary to facilitate the deep GHG reductions outlined in the DPJ's campaign pledge.

In response, this study seeks to identify influential external stakeholder groups in Japan and assess their expectations regarding energy policy goals. Influential external stakeholder groups include those members of society who are not involved in helping to shape energy policy but who hold the highest propensity to oppose the status quo (conventional energy regimes) and potentially stimulate change. This study then is premised on Kuhn's research into how entrenched technological regimes become unseated (Kuhn, 1967/1996). The basic premise is that if there is widespread divergence between influential external stakeholder groups and the LDP's

former energy policy (that emphasized energy efficiency, a gradual shift from coal and oil to natural gas and expansion of nuclear power capacity) and widespread agreement between influential external stakeholder groups and the DPJ's campaign promises of more aggressive GHG reduction initiatives, then one can conclude that political conditions exist for supporting the DPJ's campaign pledge of committing Japan to a policy program designed to reduce GHG emissions to 75% of 1990 levels by 2020. If there is not widespread divergence between expectations of influential external stakeholder groups and the LDP's former energy policy, then one would be tempted to conclude that the DPJ will likely not commit itself unconditionally to such a costly, beefed-up GHG reduction campaign but rather choose a more moderate approach which falls somewhere between the LDP's former policy and the DPJ's campaign position. The next section outlines the rationale and methodological strategies employed in seeking to define stakeholder expectations.

4. Conceptual lens and methodology of the research

4.1. Conceptualization of the stakeholder groups to study

As mentioned earlier, the rationale behind conducting primary research to assess influential external stakeholder expectations of energy policy in Japan is based loosely on research extending from paradigm shift theory (Kuhn, 1967/1996). In the lead up to technological change, market dynamics tend to intensify. Typically, vested stakeholders in power (stakeholders who are internal to the policy regime) attempt to preserve "technological lock" through enhanced commitment to marginal pricing (facilitated by superior economies of scale), political lobbying and industry consolidation (David, 2000; Lodge and Vogel, 1987). In the energy sector, fossil fuel firms have been heavily criticized for perpetuating falsehoods in regard to emergent energy technologies, funding climate change skeptics and for using special interest groups to usurp political agendas (Hansen, 2008).

While industry leaders in markets undergoing technological flux strive to defend entrenched market positions, opposing forces (external stakeholders) typically ramp up efforts to either attack prominent weaknesses in the existing technological regime or stimulate market demand in elements which favor alternative technologies (Bartlett et al., 2003; Tsai et al., 2003). In the energy sector, campaigns waged by renewable energy firms that stress the threats posed to human welfare by conventional energy technologies represents an illustration of an attempt to alter market demand profiles (cf. CanWEA, 2008).

Even if opposing forces are dwarfed in power by the entrenched technological regime, it is possible for minority stakeholders to leverage common interests and unite in "advocacy coalitions" to destabilize the status quo (Sabatier and Jenkins-Smith, 1993). Applied to energy, in many markets, wind power and solar power firms, which can be considered to be competitors in many sectors, fund renewable energy trade associations to provide more focused lobbying efforts to unseat conventional technology dominance.

Where minority coalitions are either not strong enough or not cohesive enough to unseat entrenched technological regimes, minority external stakeholders can still influence market development through political pressure tactics such as lobbying political representatives, employing media management strategies, fueling public protest and ultimately registering dissent through the electoral process (Rogers, 1995). The establishment of global trade associations, such as the World Wind Energy Association, epitomizes efforts of this type.

Overall, these dynamic market developments share a common thread—there is a marked intensification of stakeholder dissent exhibited between stakeholders that are internal to the existing

⁷ An article "Japan is not Greece" written by Jesper Koll, Managing Director at JP Morgan Japan presents a tempered view of Japan's high public debt ratio at <http://accjournal.com/japan-is-not-greece/>.

⁸ Demetriou, Danielle. "Japanese PM Yukio Hatoyama resigns over broken Okinawa base promise", 2 June 2010, The Daily Telegraph. Accessed September 14, 2010 at <http://www.telegraph.co.uk/news/worldnews/asia/japan/7795734/Japanese-PM-Yukio-Hatoyama-resigns-over-broken-Okinawa-base-promise.html>.

⁹ Johnson, Eric. "70% of Japanese back Hatoyama's CO₂ pledge: survey", The Japan Times, October 2, 2009. Accessed October 14, 2010 at <http://search.japantimes.co.jp/print/nn20091002a5.html>.

regime (direct influencers of policy) and those who are external to the regime (indirect influencers of policy). Therefore, a key conceptual premise behind the stakeholder evaluation presented in this paper is that significant stakeholder dissent should exist in key influential groups in regard to energy policy goals if a technological change in energy is truly feasible in fiscally constrained Japan.

In order to define influential external stakeholder groups in which to search for signs of divergence between expectations and existing energy policy, we conducted an extensive review of research which examined socio-demographic influences on energy policy expectations. This led to the identification of six key stakeholder groups as holding the most potential for exhibiting divergent expectations from the larger universe of energy policy stakeholders: affluent individuals, youths, senior citizens, energy industry workers, women and homemakers. Each of these groups and theory explaining their prominent perspectives on energy policy is examined in greater detail in ensuing paragraphs.

4.1.1. H1: Influence of affluence

A variety of different studies suggest that richer countries would place greater emphasis on climate change compared to poorer ones. In a broader context, it has been consistently shown that environmental governance becomes a more important civic issue as nations become more affluent (Barrett, 2005; Carter, 2001; Valentine, 2010b, in press-b). Regarding climate change, some preliminary work has noted that industrialized countries such as those in the European Union, Japan, and even Australia currently place high emphasis on climate change mitigation policy, whereas developing countries tend to prioritize economic needs over greenhouse gas emission abatement (Sovacool and Bambawale, in press; Valentine, 2010a; Wilbanks et al., 2007). Others have echoed this latter point, observing that developing countries in general tend to emphasize the necessity of achieving economic and social development goals as a prerequisite to making international commitments on greenhouse gas emission abatement (IGES, 2005). Conversely, and in support of the contention that affluence tends to sire increased environmental governance expectations, a number of studies have noted that *within* any given nation, the more affluent tend to place a greater priority on addressing climate change (Pew Research Center, 2009; Rabe and Borick, 2010) or on making transitional investments in wind, solar, and cleaner forms of energy supply (Greenberg, 2009).

4.1.2. H2: The ignorance of youth and H3: age breeds perspective

Research evidence suggests that younger people possess a less complex, narrower set of energy policy expectations while older people tend to exhibit a broader array of expectations which reflect a more sophisticated understanding of the elements which influence energy policy. After surveying more than 2700 Americans, Greenberg (2009) found that older respondents were far more likely than younger ones to support a diverse array of energy technologies (in this case coal, natural gas, oil, and nuclear power), while younger respondents were “less supportive” of a diverse portfolio. A similar study in the United Kingdom found that older respondents (aged 55–64) tended to be more supportive of nuclear power and other non-conventional technologies compared to younger respondents (aged 16–24) (Devine-Wright, 2007). The study explained that since younger people often cannot afford to install renewable energy systems, they tend to lack awareness about them. Meanwhile, other work has shown that since the elderly survive on low or fixed incomes, they are more cost sensitive to changes in energy prices and thus more aware about energy issues (Lutzenhiser, 1993; Warriner, 1981).

4.1.3. H4: Defending one's vocation

Although out-dated, a few studies suggest that those employed by the energy sector more conservative views than those held by the general population. Dunlap and Olsen (1984) examined how 130 energy advocates reacted to the energy crises of the 1970s. They found that those that worked for energy companies – primarily oil and gas corporations at the time – were much more skeptical of solar energy as an alternative technology, were less prone to advocate energy efficiency, and more prone to support heavy investment in fossil fuel and nuclear power technologies. Eighty percent of these energy firm employees also felt that increased energy consumption was an ineluctable element of economic growth. Another study found that “education” did little to ameliorate differences between petrochemical industry executives and advocates of alternative energy technologies. Researchers discovered that petrochemical industry executives and conservationists who shared common demographic and educational profiles held the most deeply entrenched, contrasting ideologies regarding support for alternative energy technologies. Both groups exhibited similar demographic profiles and shared the belief that the nation was confronting a serious and lasting crisis; they just disagreed regarding what should be done about it (Gottlieb and Matre, 1976).

4.1.4. H5: Feminism and mother earth

Broadly speaking there is support for a contention that environmentalism is a manifestation of feminist ideology (King, 1998); and therefore, women might consider climate change and renewable energy capacity development to be more important energy policy priorities. More narrowly, in terms of climate change, Kellstedt et al. (2008) notes that “research consistently shows that women and racial minorities are more fearful of the risks of climate change” and that women in particular exhibit “higher levels of environmental concern”. O'Connor and Fisher (1999) and Viscusi and Zeckhauser (2006) also argue that a gender-based difference in regard to climate change attitudes and perceptions exists. Denton (2002) sheds light on the nature of this gender difference by pointing out that women will be disproportionately affected by climatic change, thereby making it a more important political issue. In terms of renewable energy, Greenberg (2009) found in his survey of U.S. citizens that proponents of renewable energy tended to be white, highly educated women, while supporters of fossil fuels professed, strong religious beliefs, trusted authority, and tended to be minority males. Devine-Wright (2007) has introduced evidence that shows that more women support new renewable energy development (90%) in comparison to men (66%) and that men exhibit a greater preference for nuclear power.

4.1.5. H6: Closer to the front lines

Lastly, there is evidence that homemakers place greater emphasis on affordability when it comes to energy security concerns. Van Raaij and Verhallen (1983) surveyed 145 households in the Netherlands and found that homemakers tended to be more aware of the dollar amount of energy expended for recreation, child care, and household chores. Ironmonger et al. (1995) looked at household energy use in Australia and found that homemakers were becoming increasingly concerned with energy costs and energy efficiency. In Japan, Fong et al. (2007) have pointed out that households with retirees or homemakers generally consume more energy due to longer hours staying at home, that northern Japanese households consume more energy due to greater space heating and lighting needs, and that larger families consume more energy, implying that all three groups – homemakers, northern families, and larger families – will regard energy affordability as an important element of energy policy.

4.2. Research hypothesis and methodology

Given the indications outlined above that six stakeholder groups exhibit a propensity for possessing unique expectation sets regarding energy policy goals, a decision was made to conduct primary research with a demographically equitable pool of subjects (i.e., equal male and female, equal representation of age groups, etc.) and then separate the respondents belonging to the six stakeholder groups described earlier for comparison with the rest of the demographic sample. In specific, the hypotheses outlined in Table 1 were established for testing.

In April 2010, 321 Japanese citizens were asked to fill out questions (online) related to sixteen potential energy policy goals as put forth in a McArthur Foundation research project on perspectives of energy security. Respondents were asked to rate the importance of these sixteen goals in regard to energy policy

formulation. The results of this survey were separated according to the demographic characteristics necessary to evaluate the six hypotheses outlined in Table 1 and the demographic clusters were then compared to the remainder of the sample in order to identify any divergence of perspective.

5. Survey findings

5.1. H1: The influence of affluence

Regarding the hypothesis that one would expect rich countries such as Japan to place a high priority on climate change, survey responses indicate there is indeed a high degree of importance placed on mitigating climate change through greenhouse gas reduction initiatives in Japan. As Fig. 2 indicates, more respondents

Table 1
The heterogeneity of energy security views.

H1: The influence of affluence	One would expect a rich country such as Japan to place a high priority on climate change
H2: The ignorance of youth	Given that a learning curve exists in understanding the complexities of energy policy, one would expect that Japanese aged 18–25 would have a narrower set of energy policy goals when compared to the general population perspective
H3: Age breeds perspective	Due to broader experiential-based understanding of the complex issues influencing energy policy, one would expect that Japanese individuals over 65 years old would have broader, longer-term perspectives on energy policy goals when compared to the general population perspective
H4: Defending one's vocation	Due to a bias toward existing technologies, one would expect that Japanese employed in the energy sector would have more conservative (or at least different) energy policy goals when compared to the general population perspective
H5: Feminism and Mother Earth	Given the link between environmental governance and environmentalism, one would expect Japanese females to regard climate change mitigation and renewable energy capacity development as constituting more important energy policy goals when compared to the male population perspective
H6: Closer to the front lines	Given the impact that energy costs can have on household expense management, one would expect Japanese homemakers who typically manage such budgets to consider affordable and stable energy pricing as comparatively more important goals of energy policy when compared to the general population perspective

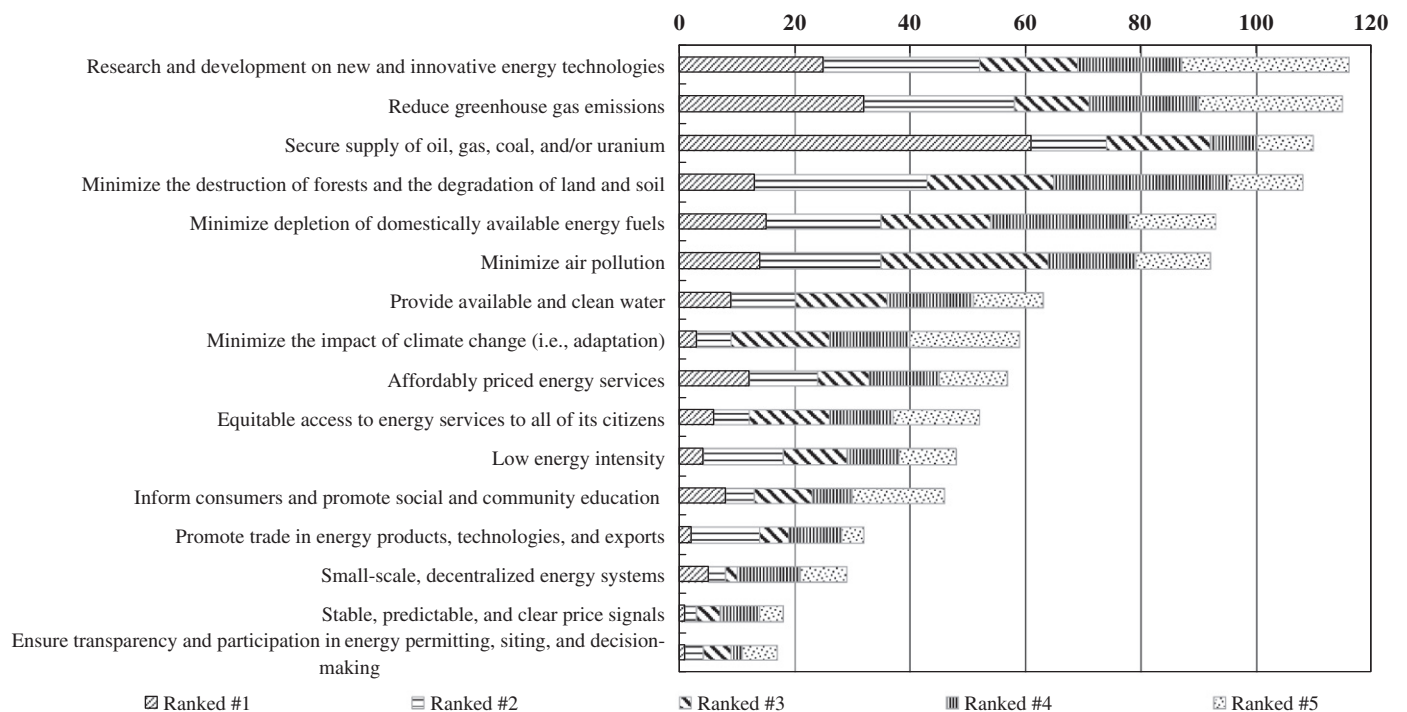


Fig. 2. Number of respondents ranking the following goals as being within the top five most important energy policy goals.

ranked the reduction of GHG emissions as falling within the top five most important energy policy goals than any other policy goal, except for improving research and development on new and innovative energy technologies. Although this supports the conclusion that importance is being placed on GHG mitigation by Japanese citizens, it is noteworthy that procuring a secure supply of oil, gas, coal and/or uranium was listed just behind the importance of GHG emission reduction as one of the top five most important goals of Japanese energy policy (Fig. 2). In other words, a contradiction exists between societal expectations of an energy policy that aims to reduce GHG emissions and aspirations to see Japan procuring a more secure supply of conventional fuel resources. Overall, the results presented in Fig. 2 suggest that Japanese voters expect policy makers to maintain a balance between affordable energy and climate change mitigation initiatives.

5.2. H2: The ignorance of youth

The data presented in Table 2 provide only weak support for the contention that younger Japanese (ages 18–25) have a less sophisticated understanding of the complex factors that are typical features of energy policy. As Table 2 illustrates, there were a few energy policy goals in which the responses from the 18- to 25-year-old group deviated in a statistically significant manner from the rest of the demographic sample. In particular, the young demographic cluster exhibited a propensity to place less importance on energy service affordability and price stability. The younger cluster also tended to place less importance on the development of small-scale energy systems, enhanced energy intensity, new energy technology research and development and improved public education.

However, although some members of the younger cluster placed “less importance” on these elements in comparison to the rest of the demographic sample, the vast majority of the younger cluster (over 70% in all cases except for small-scale energy systems) concurred with the majority of the demographic sample that all sixteen energy policy goals were either “important” or “very important”. In short, although there is evidence of a slight deviation from the general sample, there is greater evidence that the majority of young respondents share similar perspectives on the importance of these sixteen energy policy goals as the general populous.

Table 2

Younger generation perspectives on important energy policy goals.

(% answering “important” or “very important”)	18–25 (n=58) (%)	26+ (n=263) (%)	z-Value
Secure supply of oil, gas, coal, and/or uranium	86.2	90.5	0.99
Promote trade in energy products, technologies, and exports	72.4	81.4	1.60*
Minimize depletion of domestically available energy fuels	84.5	90.1	1.30
Stable, predictable, and clear price signals	77.6	91.3	3.28***
Affordably priced energy services	81.0	93.2	3.24***
Small-scale, decentralized energy systems	63.8	74.9	1.78**
Low energy intensity	81.0	89.4	1.84**
Research and development on new and innovative energy technologies	84.5	92.8	2.21**
Equitable access to energy services to all of its citizens	77.6	81.4	0.67
Ensure transparency and participation in energy permitting, siting, and decision-making	70.7	77.9	1.20
Inform consumers and promote social and community education	69.0	81.0	2.10**
Minimize the destruction of forests and the degradation of land and soil	86.2	92.0	1.45*
Provide available and clean water	82.8	88.2	1.18
Minimize air pollution	91.4	93.5	0.61
Minimize the impact of climate change (i.e., adaptation)	72.4	84.8	2.36**
Reduce greenhouse gas emissions	81.0	86.3	1.05

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

5.3. H3. Age breeds perspective

Due to insufficient sample size (we had only 13 responses to the survey who were over 65 years old), it was impossible to statistically test the hypothesis that individuals over 65 have perspectives on energy security that exhibit broader, longer-term perspectives. However, a simple comparison of percentage responses between the 65-year old and over group and the rest of the demographic sample (Table 3) suggests that the elderly stakeholders who responded to the survey did indeed have a broader set of expectations in regard to energy policy formulation. Regarding each of the 16 policy elements, 12 of 13 respondents considered every category to be of importance. However, given that over 70% of the total sample perceived each of the sixteen policy goals to be important, we would have to conclude that the broad perspective held by the elderly demographic group is shared by a majority of the general demographic set.

5.4. H4. Defending one's vocation

The survey included 110 individuals who work for the energy/utility industry. In order to test the hypothesis that perspectives on energy policy priorities held by those employed in the industry sector will be significantly more conservative (or at least different) than the views held by the general population, we compared these “industry” respondents with the rest of the survey respondents in regard to how they regard the sixteen potential policy goals. Table 4 shows the percentage of those who considered these issues as “important” or “somewhat important.”

Although one could potentially advance an argument that a weak statistically significant deviation exists between energy industry employees and the rest of the respondents in regard to the importance of trade in energy technologies, small-scale energy system development, and R&D for new technologies, the disparities in these areas are extremely small from an absolute percentage basis (Table 4). If ideological differences exist, they are of an extremely subtle nature.

Intuitively, one would expect that people employed within the entrenched energy sector of a given nation should have an aversion to the provision of financial support to competing alternative technologies because fueling competition may place conventional energy jobs at risk. In Japan's case, although a few

Table 3
Elderly perspectives on important energy policy goals.

(% answering “important” or “very important”)	65+ (n=13) (%)	18–64 (n=308) (%)
Secure supply of oil, gas, coal, and/or uranium	100.0	89.3
Promote trade in energy products, technologies, and exports	92.3	79.2
Minimize depletion of domestically available energy fuels	92.3	89.0
Stable, predictable, and clear price signals	92.3	88.6
Affordably priced energy services	100.0	90.6
Small-scale, decentralized energy systems	84.6	72.4
Low energy intensity	100.0	87.3
Research and development on new and innovative energy technologies	92.3	91.2
Equitable access to energy services to all of its citizens	92.3	80.2
Ensure transparency and participation in energy permitting, siting, and decision-making	92.3	76.0
Inform consumers and promote social and community education	100.0	77.9
Minimize the destruction of forests and the degradation of land and soil	100.0	90.6
Provide available and clean water	92.3	87.0
Minimize air pollution	100.0	92.9
Minimize the impact of climate change (i.e., adaptation)	100.0	81.8
Reduce greenhouse gas emissions	100.0	84.7

Table 4
Energy industry perspectives on important energy policy goals.

(% answering “important” or “very important”)	Industry (n=110) (%)	Others (n=211) (%)	z-Value
Secure supply of oil, gas, coal, and/or uranium	90.0	89.6	0.12
Promote trade in energy products, technologies, and exports	74.5	82.5	1.68**
Minimize depletion of domestically available energy fuels	85.5	91.0	1.51*
Stable, predictable, and clear price signals	91.8	87.2	1.24
Affordably priced energy services	90.9	91.0	0.03
Small-scale, decentralized energy systems	66.4	76.3	1.90**
Low energy intensity	85.5	89.1	0.95*
Research and development on new and innovative energy technologies	86.4	93.8	2.25**
Equitable access to energy services to all of its citizens	81.8	80.1	0.37
Ensure transparency and participation in energy permitting, siting, and decision-making	76.4	76.8	0.08
Inform consumers and promote social and community education	80.0	78.2	0.37
Minimize the destruction of forests and the degradation of land and soil	89.1	91.9	0.85
Provide available and clean water	84.5	88.6	1.04
Minimize air pollution	91.8	93.8	0.68
Minimize the impact of climate change (i.e., adaptation)	80.9	83.4	0.56
Reduce greenhouse gas emissions	87.3	84.4	0.70

*** $p < 0.01$.

* $p < 0.1$.

** $p < 0.05$.

energy industry workers attached less importance to support for new energy technologies, the fact that the majority does indeed support government initiatives to encourage the development of new energy technologies highlights the technological diversity that exists within many of Japan's major energy firms. Many of Japan's electricity generation firms have investments in nuclear power, solar power, wind power and other alternative energy technologies (Valentine, in press-a).

5.5. H5. Feminism and Mother Earth

In regard to the hypothesis that Japanese females will place more importance on climate change mitigation and renewable energy capacity development when compared to Japanese males, the data outlined in Table 5 pitting females against males, yields support – albeit extremely weak – for this hypothesis. There is a statistically significant disparity wherein more women rate the minimization of forest destruction and air pollution abatement as important goals for energy policy. However, in aggregate this disparity amounts to less than 8% for both goals. In aggregate, both males and females embrace remarkably similar perspectives regarding the importance of the 16 policy goals outlined

in Table 5. Given the marked similarities exhibited by the data, we would conclude that if environmentalism is a component of feminist ideology, then a “feminist” influence on energy policy is manifest in Japan through importance attributed to the minimization of air pollution, energy-related forest destruction and greenhouse gas emission reduction. However, this feminist influence is not gender differentiated; it is a shared ideology across the genders.

5.6. H6. Closer to the front lines

In support of the hypothesis that Japanese homemakers, who typically manage household expenses, will consider minimizing the cost of energy services to be a comparatively more important priority for energy policy, all of the thirty one respondents who were homemakers responded that affordable energy service is either an “important” or “very important” energy policy goal. Furthermore, 30 of the 31 homemakers regarded price signal stability to be either an “important” or “very important” energy policy goal. This data represents a statistically significant disparity when compared to the rest of the survey sample. However, it should be noted that even in regard to these two goals which

Table 5
Female and male perspectives on important energy policy goals.

(% answering “important” or “very important”)	Female (n=176) (%)	Male (n=145) (%)	z-Value
Secure supply of oil, gas, coal, and/or uranium	89.8	89.7	0.03
Promote trade in energy products, technologies, and exports	76.7	83.4	1.50*
Minimize depletion of domestically available energy fuels	92.6	84.1	2.39***
Stable, predictable, and clear price signals	90.9	86.2	1.33*
Affordably priced energy services	91.5	90.3	0.35
Small-scale, decentralized energy systems	72.7	73.1	0.08
Low energy intensity	86.9	89.0	0.56
Research and development on new and innovative energy technologies	90.9	91.7	0.26
Equitable access to energy services to all of its citizens	79.0	82.8	0.85
Ensure transparency and participation in energy permitting, siting, and decision-making	77.3	75.9	0.30
Inform consumers and promote social and community education	77.8	80.0	0.47
Minimize the destruction of forests and the degradation of land and soil	94.3	86.9	2.31**
Provide available and clean water	88.6	85.5	0.83
Minimize air pollution	96.0	89.7	2.25**
Minimize the impact of climate change (i.e., adaptation)	85.2	79.3	1.39*
Reduce greenhouse gas emissions	88.1	82.1	1.51*

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

Table 6
Homemakers' perspectives on important energy policy goals.

(% answering “important” or “very important”)	Homemakers (n=31) (%)	Others (n=290) (%)	z-Value
Secure supply of oil, gas, coal, and/or uranium	90.3	89.7	0.10
Promote trade in energy products, technologies, and exports	80.6	79.7	0.13
Minimize depletion of domestically available energy fuels	93.5	88.6	0.81
Stable, predictable, and clear price signals	96.8	87.9	1.65**
Affordably priced energy services	100.0	90.0	3.09***
Small-scale, decentralized energy systems	74.2	72.8	0.17
Low energy intensity	83.9	88.3	0.58
Research and development on new and innovative energy technologies	87.1	91.7	0.68
Equitable access to energy services to all of its citizens	80.6	80.7	0.01
Ensure transparency and participation in energy permitting, siting, and decision-making	77.4	76.6	0.10
Inform consumers and promote social and community education	71.0	79.7	0.98
Minimize the destruction of forests and the degradation of land and soil	93.5	90.7	0.53
Provide available and clean water	87.1	87.2	0.02
Minimize air pollution	96.8	92.8	0.89
Minimize the impact of climate change (i.e., adaptation)	90.3	81.7	1.28*
Reduce greenhouse gas emissions	90.3	84.8	0.82

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

exhibit statistically significant disparity, the vast majority of the general populace also considers affordable energy services (90%) and stable price signals (87.9%) to be important policy goals. In other words, homemakers may be slightly more sensitive to the economics of energy services but this difference is very slight; all Japanese consider affordable energy and stable price signals to be of importance (Table 6).

6. Conclusion

As Table 7 illustrates, of the six hypotheses put forth in this paper, the survey data support only the first hypothesis that one would expect a rich country such as Japan to place a high priority on climate change. In fact, mitigation of GHG emissions ranked second in terms of goals considered to be of most importance (Fig. 2 previously). However, security over conventional energy supplies ranked third in terms of goals considered to be of most

importance, indicating that there are conflicting expectations. Our interpretation of this is that Japanese citizens are highly pragmatic in their view of energy policy goals. On one hand, Japanese citizens understand that a concerted response to greenhouse gas emission abatement is needed to avert global economic and ecological peril. On the other hand, the Japanese economy is currently suffering through an extended period of stagnation; and as such, most Japanese citizens are acutely aware of the need to minimize energy costs both to support industrial competitiveness and to minimize household energy expenditures.

Confirmation that Japanese citizens place a high priority on climate change does not, therefore, suggest that the Kan administration has received carte blanche for committing to deeper GHG emission reduction targets under the Kyoto Protocol. As the survey results suggest, the equally important goal of providing affordable energy services temper any policies that might otherwise commit Japan to costly low-carbon technological transition initiatives in the energy sector. This is especially true since there

Table 7

Summary of findings related to the 6 hypothesis.

H1: The influence of affluence Hypothesis: One would expect a rich country such as Japan to place a high priority on climate change Findings: <i>General support this hypothesis</i>
H2: The ignorance of youth Hypothesis: Given that a learning curve exists in understanding the complexities of energy policy, one would expect that Japanese aged 18–25 would have a narrower set of energy policy goals when compared to the general population perspective Findings: <i>Weak support for a contention that when compared to the general populous, fewer young people tend to consider stable, affordable energy services to be an important element of energy policy. However, the deviation from general public opinion is extremely small</i>
H3: Age breeds perspective Hypothesis: Due to broader experiential-based understanding of the complex issues influencing energy policy, one would expect that Japanese individuals over 65 years old would have broader, longer-term perspectives on energy policy goals when compared to the general population perspective Findings: <i>Weak support for a contention that when compared to the general populous, a large percentage of individuals over 65 do exhibit broader, longer-term perspectives regarding energy policy formulation. However, the deviation from general public opinion is extremely small</i>
H4: Defending one's vocation Hypothesis: Due to a bias toward existing technologies, one would expect that Japanese employed in the energy sector would have more conservative (or at least different) energy policy goals when compared to the general population perspective. Findings: <i>Weak support for a contention that when compared to the general populous, a smaller percentage of energy industry workers support research into alternative energy technologies. However, the deviation from general public opinion is extremely small.</i>
H5: Feminism and Mother Earth Hypothesis: Given the link between environmental governance and environmentalism, one would expect Japanese females to regard climate change mitigation and renewable energy capacity development as constituting more important energy policy goals when compared to the male population perspective Findings: <i>No support for the contention that women regard climate change mitigation and renewable energy capacity development to be more important policy goals. However, there is support for a contention that Japan embraces feminist principles in regard to energy policy development that is not differentiable across gender lines</i>
H6: Closer to the front lines Hypothesis: Given the impact that energy costs can have on household expense management, one would expect Japanese homemakers who typically manage such budgets to consider affordable and stable energy pricing as comparatively more important goals of energy policy when compared to the general population perspective Findings: <i>Weak support that when compared to the general populous, a greater percentage of homemakers are more concerned about the economics of energy service. However, the deviation from general public opinion is extremely small</i>

is near uniform agreement across all six chosen stakeholder clusters that ensuring affordability in energy service provision and mitigating GHG emissions are dually desirable.

Regarding the remaining five hypotheses, the research data suggests that there is weak support for four of the hypotheses. Younger Japanese (ages 18–25) do indeed appear to exhibit a slightly less sophisticated understanding of the complexities and interrelationships amongst the sixteen energy policy goals (H2). Meanwhile, older Japanese (ages 65 and over) exhibit a slightly greater propensity to consider all of the 16 energy policy goals to be of importance (H3). People employed in the energy industry do indeed appear to possess a subtly more conservative approach to energy policy goals, but the difference is extremely subtle (H4). Finally, the data does indeed indicate that more homemakers are concerned about the economics of energy services; however, this concern is shared by the vast majority of all Japanese. Overall then, although an argument can be made that subtle differences do indeed appear to exist between four influential stakeholder groups, these differences are *extremely* subtle—in most cases reflecting aggregate percentage differences that are less than 10% when compared to the rest of the demographic sample (i.e., although 100% of the housewives responded that affordably priced energy services is an important criteria in energy policy, 90% of the general population sample also rated affordably priced energy services as an important criteria) and in no cases indicating a significant ideological divergence from the general sample.

The only hypothesis in which no support was in evidence related to the hypothesis that Japanese females would consider climate change mitigation and renewable energy capacity development to be more important energy policy goals when compared to the perspectives of Japanese males. The data suggests that there is no difference between genders in regard to perspectives held regarding these two policy goals with both genders placing high importance on climate change mitigation and technological support for renewable energy. Therefore, if there is a

“feminist” influence on stakeholder perceptions of appropriate energy policy, the feminist ideology is shared across gender lines.

In summary, the most remarkable outcome of this research study is the degree to which all stakeholder groups share the understanding that energy policy is essentially about balancing a complex portfolio of potentially conflicting goals and all of the sixteen goals put forth as potential policy goals should be considered to be important.

Although one might be tempted to conclude that the results simply provide more evidence of the homogeneity existent in Japanese society, it is of value to recall Lodge and Vogel's observation regarding homogeneity in Japan—it has not occurred naturally; it has been forged by national policy (Lodge and Vogel, 1987). In other words, we would postulate that the long reign of the LDP and the associated prolonged exposure that the public has had to a fairly stable energy policy appears to have fueled a high degree of common public understanding that all sixteen policy goals must somehow be balanced within the nation's energy strategy. It appears to us that government communication has been fairly successful in shaping public perception regarding Japan's energy policy challenges over the years and has now achieved a state in which public perception and government policy are remarkably similar. To support our postulation, we would contend that a layperson is unlikely to understand the importance of decentralized, small-scale energy systems in facilitating GHG emission reduction and enhancing national energy security without a degree of educational insight into how such systems support key policy goals in these areas. Such educational insight is not likely provided in conventional educational environments; yet remarkably, a high degree of consensus exists regarding the importance of this factor.

On the other hand, an alternative explanation for the remarkable amount of consistency exhibited by stakeholder groups regarding which energy goals are important is that Japanese culture is characterized by aversion to disagreement and so the act of asking

respondents to evaluate the importance of sixteen potential energy goals is likely to encourage responses of “important” (Nakane, 1995). In short, there is an argument that can be made for survey construct bias (Cook and Campbell, 1979). However, the fact that there are statistically significant differences between the levels of importance attributed to the sixteen goals tends to repudiate this concern.

Although it is beyond the scope of this paper to delve deeper to fully explicate the source of this remarkable degree of homogeneity in regard to energy policy expectations in Japan, the existence of such homogeneity cuts to the very core of this paper. Two key goals of this paper were to help conflate the Kan Administration's refusal in Cancun to commit to further GHG emission reductions without broader international participation with its campaign promise of more aggressive GHG emission reduction efforts and to evaluate how likely is it that any future commitments on the part of the DPJ administration will diverge from the basic strategy put forth by the predecessor LDP party. We posited that due to Japan's stagnant economic environment and the Japanese government's restrictive budget deficit, the Kan Administration would only adopt aggressive GHG reduction initiatives if there were sufficient popular support (particularly support from influential external stakeholders) for sacrificing energy service affordability to finance such aggressive GHG abatement initiatives. The data presented in this paper suggest that such support is not in evidence. Rather, the data suggest that there is a high degree of consensus amongst the Japanese general public regarding which elements of energy policy are important and the consensus is that Japanese stakeholders want the government to play a role in GHG emission abatement but not to the significant detriment of energy service affordability. This then helps to explain the hard line stance taken by the Japanese government in Cancun despite its campaign promise.

There is insufficient evidence of divergence between influential external stakeholder perspectives regarding energy policy goals and former LDP energy policy goals to provide the DPJ with the political support for committing to energy policies that result in significantly greater GHG reduction targets achieved at a financial cost to the Japanese taxpayer or to Japanese industry. Accordingly, it is likely that the campaign pledge of reducing GHG emissions to 75% of 1990 levels by 2020 will be tempered by fiscal constraints. It is highly probable that the government will commit to an overall energy transition policy that resembles the LDP platform, (i) incentives for energy efficiency, (ii) a shift away from coal and oil to gas and (iii) continued plans to expand nuclear power capacity.

Indeed signs of this are already in the works. On September 10, 2010, the Kan Administration announced a US\$10.91 billion economic stimulus package that includes support for energy efficient industries to build plants in Japan, an extension of a residential subsidy program to encourage consumers to purchase energy saving appliances, low interest loans for environmentally friendly homes and deregulation of the energy sector. Since the deregulation plan does not apparently include a break up of Japan's regional utility monopolies, the initiative can be considered to be an effort to improve the cost of electricity generation and will likely have little impact on the commercial prospects of alternative energy providers (Valentine, in press-a).

Given this analysis, we would speculate that the Kan Administration will more or less mirror the LDP strategy in regard to GHG reduction initiatives. Plans to expand the nuclear power program in Japan will likely continue toward the stated goal of 40% nuclear power contribution to Japan's electricity mix. Given the purported low cost of nuclear power generation in Japan (FEPC, 2008), if the Kan Administration does decide to seek bolder GHG reductions it is highly likely that some of these reductions will come from ramped up nuclear power development targets. Renewable energy technologies, which are perceived to undermine energy service affordability,

will continue to be de-emphasized while Japan focuses on encouraging energy efficiency through industrial and residential subsidies.

If the international community agrees to deeper GHG emission reduction targets sometime in the future, we can extend our analysis to speculate that the Japanese position will embrace two tenets. First, Japan will likely play a willing part in agreeing to deeper reduction commitments; however, there will be a tendency on the part of Japanese negotiators to push for targets that are less extreme in the short-term and more robust long-term. This will give the Kan Administration time to get a better feel for how energy efficiency incentivization initiatives are faring and time to try and turn around the Japanese economy in order to enhance government revenues that are necessary to support energy technology investment initiatives. This strategy is likely to perpetuate regardless of whether or not the DPJ is elected to a second term because Japanese citizens broadly support proactive participation in international GHG reduction efforts.

Second, Japan will likely push aggressively for developing nations to commit to emission reduction targets under any future GHG reduction agreement, as was the original intent of the UNFCCC. This can be expected because given Japan's precarious economic outlook, Japan's leadership does not have the political leverage to support deeper, potentially costly emission reduction targets without similar financial commitments being made by nations which are challenging Japan's industrial dominance in key areas. This group would include South Korea and Singapore and to a lesser extent China and Malaysia.

The Kan Administration may in the end prove this analysis to be misguided and Japan may indeed live up to its potential to be a market mover in both energy technology transition and climate change negotiations by demonstrating proactive leadership in international commitments, but adverse economic circumstances and the absence of clear public support for a significant change in energy policy strategy suggest that the Kan Administration or any other subsequent leadership faction (DPJ or otherwise) is not “empowered” to do so.

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