STAKEHOLDER MANAGEMENT AND SUSTAINABILITY IN THE FRENCH NUCLEAR INDUSTRY

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Energy has become a major issue in the agenda of governments, institutions, business firms and the public. Preventing global warming while meeting the world's energy needs is of critical importance to the sustainability of the planet (IES, 2008). However, the demand for non-renewable resources continues to rise with continued population growth further exacerbating the situation. Between 1945 and 2009 the world's population increased from 2 billion to 6.2 billion and the OECD estimates that the planet will have nearly 9 billion people by 2050. Population growth will occur mainly in the developing regions of the world where energy needs will rise significantly. World consumption of electricity is estimated to grow at 2.4% per year between 2006 and 2030 with higher levels of growth in China and India (IAE, 2008). However, electricity production is dominated by fossil fuels combustion such as petroleum, coal and natural gas. These production processes are a major cause of global warming through greenhouse gad emissions. The Intergovernmental Panel on Climate Change (IPCC) estimates that the world temperature can rise from 1.1 to 6 degrees Centigrade before the next century with devastating environmental and social consequences. Dramatic reductions on greenhouse gas emissions coupled with fundamental changes in the traditional energy production model are needed to ensure planetary survival.

Given the political and economic power of the global fossil fuel lobby energy experts admit that the traditional energy model will be hard to replace. Renewable energy sources such as biomass, solar power, wind power, geothermal energy and hydroelectric energy only represent 3% of the world consumption. Investment in these technologies could reduce the world's dependence on fossils but the capacity to invest in non-renewable energy and the technological capability is unevenly distributed. Our inability to stock energy is also a problem because renewable sources do not produce energy continuously. There are ongoing efforts to provide solutions to the energy storage problem as in Germany where plans are underway to build an energy distribution network that would connect wind power stations in the north of the country with solar power stations in the south. However these developments are limited to a select few industrialized countries.

In the context of energy sources the nuclear power industry has an ambiguous status. While many institutions and governments consider nuclear energy as a 'sustainable' solution to the energy crisis there are serious concerns about the safety and ecological impact of the industry as well as the treatment of radioactive waste. Nuclear power corporations are often the targets of activist green groups and there is both a material and ideological battle currently being waged about the risks and benefits of nuclear energy.

In this paper we describe how the sustainability debate is being played out in a nuclear power corporation and how the discourse influences the way corporate managers translate sustainable development into practices. Our case study focuses on one of the world's largest nuclear power generators and describes how the company manages the conflicting interests of its key stakeholders. We show how by managing different stakeholders – from those opposed to nuclear power to those that support nuclear power to others that have neutral views – the corporation is able to sustain its economic growth strategy while shaping the debate about sustainability to a 'sustaining growth' paradigm. We argue that despite public espousals of integrating social and environmental concerns in an aim to make the nuclear industry more 'sustainable' there is no significant shift in the corporate world view with a 'business as usual' approach that places a priority on economic growth.

The sustainability discourse: From planetary sustainability to corporate sustainability

Discourses of sustainable development emerged in the 1980s as evidence of the negative environmental and social consequences of economic growth mounted. It is a concept that is mired in much confusion and ambiguity with more than 100 'definitions' (Faber, Jorna, & Engelen, 2005). The widely used Brundtland definition of sustainable development as 'a process of change in which the exploitation of resources, direction of investments, orientation of technological development and institutional change are made consistent with future as well as present needs' (WCED 1987: 9) is more of a slogan than a definition. Apart from attempting to reconcile economic growth with environmental protection, the sustainable development agenda of Brundtland also focuses on social justice and human development within the framework of social equity and the equitable distribution and utilization of resources. Despite its broad appeal as a concept sustainable development has been critiqued by several scholars who argue that it is unclear on the nature of human 'needs and wants', continues to promote a growth model, relies on market mechanisms to ensure that environmental and social concerns will be addressed and promotes neo-colonial modes of development by obscuring significant differences in resource access and utilization between countries (Bandy, 1996; Banerjee, 2003; Escobar, 1992; McAfee, 1999; Redclift, 1987). Proponents of sustainable development claim that it marks a fundamental paradigm shift in the way development should proceeds while its critics argue that it is still business as usual tinged with some green credentials. Economic growth continues to be privileged except that it is now recast as sustainable growth with conventional notions of capital, income, and growth continuing to inform this 'new' paradigm. Rather than reshaping markets and

production processes to fit the logic of nature, sustainable development uses the 'logic of markets and capitalist accumulation to determine the future of nature' (Shiva 1991: 121).

It is not surprising that discourses of sustainability at the level of corporate strategy reflect market-based approaches instead of political and institutional interventions. For instance, one of the aims of the 'Vision of Sustainable Development' promoted by the Business Council for Sustainable Development is to 'maintain entrepreneurial freedom through voluntary initiatives rather than regulatory coercion' (Newton & Harte, 1997: 91). And perhaps the ultimate triumph of corporate control of sustainability is the Dow Jones 'Sustainability Index' which defines a sustainable corporation as one 'that aims at increasing long-term shareholder value by integrating economic, environmental and social growth opportunities into its corporate and business strategies' (Dow Jones Sustainability Group, 2000). It is interesting to note the discursive shift from planetary sustainability to corporate sustainability. The underlying assumption is that corporations must be sustainable for the planet to be sustainable. And that corporate sustainability is possible only if environmental and social issues result in 'growth opportunities'. Robert Shapiro, the ex-CEO of Monsanto sums up the business approach aptly: 'Far from being a soft issue grounded in emotion or ethics, sustainable development involves cold, rational business logic' (Magretta 1997: 81).

While there is no doubt that corporations play a significant role in achieving sustainability it is simplistic to assume that current environmental practices are compatible with notions of sustainability. Most companies focus on operational issues when it comes to greening and lack a 'vision of sustainability' (Hart 1997). Instead theoretical attempts to integrate environmental and social issues into corporate strategy have focused on the social role of corporations. Concepts like corporate social responsibility (CSR), corporate social responsiveness, corporate citizenship as well as a host of models, categories and taxonomies an attempt to define the social responsibilities of corporations. Carroll's (1979) categories of CSR as consisting of economic, legal, ethical and discretionary responsibilities have been influential in understanding the nature and type of obligations that business has to society. According to Carroll (1979, p. 500) the fundamental social responsibility for any business firm in this framework is its economic responsibility – 'to produce and services that society wants and to sell them for a profit'. Other responsibilities and roles are framed from this fundamental assumption – corporations are expected to follow all necessary laws while seeking to make profits and they are expected to behave ethically in areas that are not codified by law.

While the primary function of the firm is economic (normatively defined as enhancing shareholder value) some scholars have challenged the shareholder primacy theory of the firm arguing that focusing purely on the economic function of the firm ignores the complexity that firms have to deal with along with related inefficiencies, information asymmetries and multiple incentive problems. They propose a stakeholder theory of the firm that broadens a firm's role to include other external and internal actors apart from shareholders (Donaldson, 1999; Hill and Jones, 1992). Freeman (1984) provided probably the most widely accepted definition of a stakeholder defining stakeholders as 'any group or individual who can affect or is affected by the organization's objectives'. This broad view is not without its problems: different stakeholders have differing interests and balancing the needs of competing stakeholders is not an easy task. CSR and stakeholder theory also have their fair share of critics – some see CSR activity as 'theft' from a firm's key stakeholder groups: shareholders, customers and employees (Friedman, 1962) while others argue that CSR serves as a smokescreen even a form of 'stakeholder colonialism' that serves to regulate stakeholders (Banerjee, 2000), and is an 'ideological movement' intended to legitimize the power of multinational corporations (Mitchell, 1989).

Theoretical approaches to a stakeholder theory of the firm have focused on its descriptive, instrumental and normative aspects (Donaldson and Preston, 1995). Descriptive approaches have focused on understanding managerial perceptions about stakeholder salience, the role of the board and organizational-stakeholder relationships. Instrumental approaches have focused on the consequences of serving stakeholders, particularly the financial benefits generated by such a strategy. The normative justification of stakeholder theory has its roots philosophical and moral arguments about fairness and reciprocity (Phillips, 1997), Kantian ethics and justice (Bowie, 1999), theories of social contracts (Donaldson and Dunfee, 1994), as well as notions of corporate integrity and cooperative relationships with the community (Solomon, 1994).

However, as Margolis and Walsh (2003) have pointed out the 'practical necessities' of stakeholder theory have meant that normative justifications beyond that of providing shareholder value have not gained significant ground in theory or practice. The focus is almost entirely on win-win situations where a particular 'social' initiative is evaluated by its economic benefit to the firm. Commenting on the results of a meta-analysis of more than 25 years of empirical studies on the link between corporate economic and social performance, Orlitzky et al. (2003) claimed that the literature was 'over inclusive' in defining organizational stakeholders and called for a more 'restrictive' concept of stakeholders in order

to establish a stronger link. This implies a focus on stakeholders who can influence the financial or competitive position of the firm, leaving little or no resources directed to serve the interests of marginalized stakeholder groups (Banerjee, 2007).

To summarize, we can discern three approaches to stakeholder theory in the literature: the shareholder value perspective which sees stakeholder theory as a 'dangerous distortion of business principles', the stakeholder value perspective aimed at making corporations more socially responsible by balancing the needs of different stakeholders and the managerial perspective, a 'middle way' that identifies salient stakeholders in order to manage them efficiently. Despite some attempts to broaden the role of the firm using more inclusive normative criteria the dominant approach in stakeholder theory and practice focuses on a narrow list of stakeholders whose interests and influence directly relate to a firm's economic interest. As Roberts (2003, p. 251) points out at best these 'win-win' CSR policies can produce 'moments of calculated cooperation when reciprocal self-interests coincide and ethical justification can take the form only of an argument that ethics pays'.

An influential framework to determine stakeholder salience was developed by Mitchell et al. (1997) who classified stakeholders based on their possession of three attributes: power (the stakeholder's power to influence the company), legitimacy (of the stakeholder's relationship with the company) and urgency (the extent to which the stakeholder's demands require immediate attention). While this framework has been critiqued because of its inadequate analysis of power and legitimacy (Banerjee, 2000) it remains a widely used descriptive framework. Senior managers of corporations determine the salience of stakeholders and those deemed salient tend to receive management attention. Typically, corporations tend to focus on stakeholders with higher levels of power, legitimacy and urgency: the demands of these 'definitive' stakeholders (Mitchell et al. 1997) normally get the attention of top management. Interestingly, Mitchell et al. (1997: 878) define the group of stakeholders who have urgency and power but 'lack' legitimacy as 'dangerous stakeholders' and deplore their actions as being 'outside the bounds of legitimacy, dangerous both to the stakeholder-manager relationship and to the individuals and entities involved'. They single out 'wildcat strikers' and 'coercive environmentalists' as examples of dangerous stakeholders. While a few anti-nuclear protests have turned violent and some actions of 'coercive environmentalists' may not be seen as legitimate it is not accurate to portray these groups as lacking legitimacy. Rather, it is their influence on the general public, governments and the media that can determine the level and extent of corporate responses to environmental activism.

As we will see in our case study, in the context of the nuclear industry managers identified three groups of stakeholders whom they considered were crucial for the future of the nuclear power industry. The groups differed in their power to influence company policies but nevertheless received varying degrees of attention from corporate managers. *Supportive stakeholders* were organizations and institutions that were in favor of nuclear power and saw it as a clean energy source with manageable risks. This group included international institutions, some governments, non-governmental organizations, scientific associations and industry associations. *Obstructive stakeholders* were anti-nuclear and environmental activist groups whose policy was to completely phase out all existing nuclear power reactors and prevent any new ones from being constructed. *Passive stakeholders* consisted of the general public and sections of civil society that did not hold strong views about the benefits or risks of nuclear power. They did not oppose government or corporate plans to expand nuclear plans so in a sense provided tacit support for the nuclear power industry. This stakeholder group has some similarities with dormant stakeholders identified by Mitchell et al. (1997) as groups that had power but no legitimacy or urgency except that in our case passive stakeholders as members of the general public certainly are legitimate actors.

The study setting

The nuclear industry provides 16% of the world energy consumption. The world nuclear capacity in 2007 was 372 GW of which about 309 GW is in the OECD countries. The nuclear energy market is geopolitical and highly regulated. It involves three key actors: international agencies, governments and private or public electricity suppliers. Because of weapons proliferation concerns, the market is strictly controlled by international agencies. Nuclear power corporations can only sell nuclear plants to countries that have ratified the Non Proliferation treaty of 1968 accept regular monitoring and inspections from the International Atomic Energy Agency. Governments are key actors in the nuclear power industry because they have the authority to commission new nuclear reactors and negotiate with nuclear power corporations and international agencies. Local electricity suppliers play more of an operational role in developing and maintaining nuclear power stations and the linked electricity distribution network. Table 1 identifies the key international and national agencies that regulate the nuclear power industry in France. In this example, we can see that there are other regulatory agencies that control suppliers and customers, provide security and safety, radioactivity protection and actively participate in radioactive waste management at the national scale.

Key international agencies	
AIEA: International Atomic Energy Agency	International nuclear energy control, fight against proliferation
NEA: OECD Nuclear Energy Agency	Coordinate and promote civil nuclear power in OECD countries
EURATOM	Secure nuclear supply for European countries
National nuclear supervision	
DIREM : General direction of Energy and raw material, direction of energetic and mineral resources	Nuclear sector supervision, international civil nuclear follow-up
DIDEME : General direction of Energy and raw material, direction of energy markets	EDF supervision
ASN : Nuclear safety authority	Nuclear safety and radioprotection control
HFD : Official of Defence	Raw material, nuclear plants and nuclear transportation safety
IRSN : radioprotection and nuclear safety institute	Safety and radioprotection experts
ANDRA: National agency for radioactive waste management	Radioactive waste management
French Nuclear power industry corporations	
CEA	Nuclear fuel and reactors research center
AREVA-NP	Conception and maintenance of nuclear stations and nuclear fuel provider
EDF	Electricity public supplier, construction and exploitation of nuclear stations
AREVA-NC	Fuel cycle: mining, uranium enrichment, recycle and fuel retreatment

Table 1

Key Regulatory Agencies in the French Nuclear Power Industry

Source: French Ministry of Economy, finance and industry, DGEMP, 27/11/2006.

While these regulatory agencies are important stakeholders for nuclear power corporations their main roles is monitoring and enforcement of environmental regulation. Most firms adopt a compliance strategy in dealing with regulatory agencies, however these agencies do provide social legitimacy for the nuclear industry. The nuclear power industry is relatively young but has an eventful history of protests, accidents leading to death and disease and deeply divided yet paradoxically ambiguous perceptions. Once universally considered as an expensive and dangerous form of energy generation the nuclear industry appears to have

received a new lease of life thanks to concerns about greenhouse gas emissions and global warming. Advocates of nuclear power point to the ability of the sector to produce continuous energy in large quantities without emitting greenhouse gases. According to the International Energy Agency, world demand for nuclear energy should increase because of economic growth in developing countries, rising fossil fuel prices and increasing CO^2 emissions (IEA, 2008). It is estimated that nuclear energy could comprise between 30% to 40% of world energy consumption by 2050 (DGEMP-DIREM, 2006). Table 2 shows the number of nuclear plants currently under construction.

Country	**Number of reactors**	**Capacity (MW)**
Argentina	1	692
Bulgaria	2	1 906
China	6	5 220
Chinese Taipei	2	2 600
Finland	1	1 600
France	1	1 600
India	6	2 910
Iran	1	915
Japan	2	2 166
Korea	3	2 880
Pakistan	1	300
Russia	7	4 724
Ukraine	2	1 900
United States	1	1 165
Total	**36**	**30 578**

Table 2

Nuclear power plants under construction as of August 2008

Source : IAEA PRIS Database (available at www.iaea.org)
Note from IAEA: Installed capacity is net (electricity only).

However, while world demand for nuclear energy is on the rise some countries like Germany, Belgium and Sweden have implemented policies to phase out nuclear power,

mainly because of safety concerns expressed by their citizens. The anti-nuclear lobby in these countries is quite powerful and has been successful in influencing public perception of the nuclear industry as dangerous and environmentally destructive. While world nuclear capacity is estimated to rise from 372 GW to 433 GW by 2030 the nuclear capacity of the European Union is expected to decrease from 131 GW to 89 GW during the same period (IEA, 2008). The global nuclear industry therefore finds itself at a crossroads between economic growth and environmental and safety concerns amidst a complex changing political environment that can be hostile or supportive depending on geopolitical contexts.

The uncertain external environment and concerns about climate change and global warming also present a business opportunity for nuclear energy corporations to jump on and direct the bandwagon of 'sustainable development'. Several leading nuclear power corporations now have mission statements about how their operations contribute to sustainable development and how their vision and values reflect the Millennium goals of the United Nations of eradicating poverty, providing energy access to people and acting responsibly toward the environment. For example, the U.S. nuclear corporation Westinghouse declares that its primary goal is 'to satisfy the world's growing demand for energy' and being 'safe and environmentally responsible' (Westinghouse, 2009). The British firm BNFL declares in its mission statement that is a 'responsible, responsive and sustainable, long-term business' (BNFL, 2009). And the French corporation AREVA defines its mission as 'providing its customers with solutions for carbon-free power generation' and 'has a leading role to play in meeting the world's energy needs'. The company also declares that 'sustainable development is a core component of the group's industrial strategy' (Areva, 2009).

Beyond such bold statements that have more than a tinge of green washing how do these nuclear power corporations integrate the concept of sustainable development into their strategy? Our case study was conducted with one of the world's largest nuclear power corporations who at the time of the study were in the process of implementing a sustainable development strategy in it all its operations. As we will see the corporation adopted a strategy of 'sustainable growth' a discourse that it has created through its interaction with a diverse group of external and internal stakeholders.

Our study was designed to understand managerial perceptions of sustainability and stakeholder engagement in a nuclear power corporation. We therefore chose to use a grounded theory approach using a single case study. During a two year period starting in 2005 data were collected through interviews, document analysis and observations in a number

of sites. A total of 120 interviews comprising more than 2000 pages of transcribed text were conducted. In addition, 96 internal and external documents and reports were analyzed and four research journals (more than 500 pages of text) describing empirical observations were maintained during the data collection period. Each interview lasted for 90 minutes and respondents came from different organizational levels as shown in Table 3. Interviews were tape-recorded and fully transcribed. Respondents were recruited for the study using a snowball sampling strategy.

Hierarchical level	**No. of Respondents**
• Corporate executives	21
• Functional managers	15
• Administrative employees	20
• Secretaries	5
• Corporate advisors	2
• Operational managers	23
• Foremen	14
• Technicians	8
• Operators	12
Total	**120**

Table 3

Study Participants

Respondents were asked three initial questions about (1) their subjective understandings of sustainable development and corporate social responsibility (2) the company's commitment to these concepts, and (3) how they would define the current context and stakeholders of the nuclear industry. They were then asked to describe the type of actions conducted by the company they felt were related to sustainable development. Data analysis was conducted using criteria and procedures following Straus & Corbin's (1990) grounded theory approach. Interviews were first coded through a thematic analysis. Sections of text of varying lengths that reflected particular meanings or concepts were coded and named (D'Unrug, 1974). For example, the term 'triple bottom line' was coded as 'balancing economic, social and environmental stakes' and every paragraph or line expressing similar ideas were included in that theme. A constant comparison procedure was then used to generate new and coherent categories of meaning. The process involved comparing data from

different respondents as well as responses from individual interviews at different sections of the narrative in an effort to enrich the meanings of existing categories or develop new ones. Axial coding was then used by comparing categories by identifying relationships between the themes generated and when needed some categories were combined to reflect a second order of meaning of a broader concept. A category list was then generated with relevant concepts identified by respondents that related managerial perceptions of sustainability and stakeholder attributes to concrete translation of sustainability into organizational practices. In the next section we will first present an overview of the current nuclear energy context. Then, we discuss the findings from our case study that relate to managerial perceptions of stakeholders in the nuclear industry and organizational strategies to respond to stakeholder needs. Our analysis identifies three categories of stakeholders: supportive, obstructive or passive. We also identified a range of organizational responses to address the competing demands of their stakeholders that can be broadly described as a 'sustainable growth' strategy.

Results

Our findings indicate that organizational members differentiate three groups of stakeholders that are crucial for the future of nuclear power industry: those who support the industry, those who are strongly against this industry and the largest group - those who are neutral and passive in this debate. After discussing the attributes of each of these groups, we will show how managers negotiate what we call a 'stakeholder paradox' by converging divergent stakeholder views into a 'sustainable growth' paradigm. Sustainable development was translated as sustainable growth stemming from the organization's strategy to serve the interests of its supportive stakeholders, promoting environmental responsibility to its obstructive stakeholders in an attempt to enhance the organization's legitimacy and avoiding risks that could create negative perceptions among passive stakeholders. A key finding was that the nuclear power corporation's strategy was strongly driven by external stakeholders. This has implications for both policy and civil society because for any meaningful environmental initiatives to take place targeting external stakeholders may lead to more comprehensive actions by nuclear energy corporations.

Supportive stakeholders

According to respondents, their supportive stakeholders are governments and international institutions such as International Monetary Fund (IMF), World Bank (WB), United Nations for Sustainable Development (UNSD) and Organization for Economic

Cooperation and Development (OECD) through the Nuclear Energy Agency (NEA). These stakeholders are powerful because they set the energy agenda and rules of the game at national and international levels. While governments have been traditional allies of the French nuclear energy industry there is increasing interest in developing nuclear energy from international institutions mainly motivated by concerns about climate change and greenhouse gas emissions. Governments literally created the nuclear industry starting from its original military use during World War II and the subsequent arms race during the Cold War period. Civilian nuclear programs were marginal until the oil crisis on 1973 when nuclear energy emerged as a potential substitute for electricity production. However, the technological sophistication that was required along with proliferation risks limited the numbers of countries that were allowed to develop civil nuclear programs. At the international level as well as the national level, decisions about new product development, construction of nuclear stations and radioactive waste storage area were taken by the government assisted by the scientific community and defense ministries. The current debate about the rights of Iran and North Korea to develop its own civil nuclear program reflects the powerful geopolitical nature of the nuclear energy industry.

In France, the government has always been proud and supportive of its nuclear industry and promoted its expansion, often disregarding civil society claims and expectations. However, governments can change and be replaced by other governments who may not be as supportive of nuclear energy. The respondents in our study were acutely conscious of the potential for a significant policy shift that could hurt the nuclear energy industry especially after the nuclear phase-out policy following a change in the German government in 2001, as some of the quotes below indicate.

Respondents	**Illustrative Quotes**
(Sustainable development manager, n°2, case A)	"We cannot forget the German case. Government can be very supportive and the French one is like that, but we know that the nuclear phase-out policy can be an electoral promise. It is a big deal for us."
(Sales manager, n°13, case A)	"Governments are our first customers and we have to satisfy them. And they have to satisfy citizens if they want to be re-elected. More than government, it is people that we have to convince."
(Operational manager, n°69, case 1)	"We have not problem with governments. Only when we don't respect the law but this is normal. Otherwise, they help us because they understand the relevance and complexity of our job. They

	understand it better than people who always fight against us."

Growing concerns about climate change created a new set of allies for the nuclear energy industry: international institutions such as United Nations Division for Sustainable Development, the World Bank and the OECD. According to some respondents the pro-nuclear energy policy of international institutions were motivated by both economic and environmental interests as indicated by the quotes below:

Respondents	**Illustrative Quotes**
(Sustainable development manager, n°1, case A)	"The idea is that there is no development without energy. So if you want to develop, you must produce energy to respond to the growing energy demand. The current model is based on fossil fuel. So we need to do something else and the nuclear power generation appears as a potential actor for international institutions. Because we can produce lot of energy and answer to a part of the demand, not the all demand, but a part."
(Financial Control manager, n°35, case A)	"You know, the major problem of the century is the climate change. It is linked to greenhouse gas coming from the transformation of petroleum, coal, gas… the nuclear industry does not contribute to climate change. These people [Institutions] like us for that. We do not pollute the environment! well… nuclear industry has others problems and risks, such as radioactive waste, that we have to deal with…"
(Corporate strategy manager, n°8, case A)	"The amazing think is that the nuclear industry was always considered as opposite to sustainable development because of waste. But now, sustainable development is an ally because of climate change. Now the nuclear power industry is the solution to environmental issues! Have a look on UN or GIEC report concerning nuclear industry, they are strongly with us, we were the environmental evil and now, we are angel!"

For these international institutions, the nuclear power industry can produce continuous energy, has a high initial cost but a low cost during his life, and can meet the world's growing energy needs emitting greenhouse gas or using fossil fuels. Dangers of radioactive waste and accidents are minimized through a strong belief that science and technology will find a way to reduce these risks. Energy policies of most international institutions are in line with the Nuclear Energy Agency policy which states: 'The analysis of nuclear energy characteristics within a sustainable development framework shows that the approach adopted within the nuclear energy sector is generally consistent with the fundamental sustainable development goal of passing on a range of assets to future generations while minimizing environmental

impacts and burdens' (Nuclear Energy Agency, 2007). Functional and operational managers in our study also echoed the view of nuclear power as a sustainable and clean source of energy and cited the claims of key institutional actors to make their case.

Obstructive stakeholders

In direct contrast to the pro-nuclear energy view of supportive stakeholders is the position of obstructive stakeholders whose goal is the cessation of all nuclear activities both for civil and military purposes. Respondents cited Greenpeace and Sortir du nucléaire as the two most prominent environmental activist groups in France who were aggressively opposed to nuclear power. However, most respondents felt that the activist views were 'extreme' and not shared by a majority of the population as the following quotes illustrate:

Respondents	**Illustrative Quotes**
(Communication director, n°5, case A)	"You have to understand that we face people whose job is to fight against us. They are not many but they work hard. They want to close our activity and they can be very aggressive. The good thing is that it obliges us to be more rigorous than others because if we make a mistake, they won't forgive us."
(Quality manager, n°23, case B)	"I spent 31 years in this company […] Anti-nuclear have always been violent and dangerous. They were obstructing roads for our trucks not to circulate, the same of the train. Each time we had a radioactive transportation we were afraid to have an accident, not because of us but because of them."
(Corporate jurist, n°22, case A)	"We have often legal contentious with Greenpeace and "sortir du nucléaire". Last time, it was because of the America's cup. Greenpeace came with a little boat and injured our boat. Sometimes it is for civil protestation. The last time it was because of used fuel transportation to our nuclear site. We launched a legal action against them because they did not respect the 500 meters security perimeter around the truck. Defamation and denigration on website is not a big deal for us, we just let them do. However, when they use our logo and put dead fish or dead head on it, we do something because of brand property."
(Foremen, n°107, case 3)	"These people say that Hiroshima is because of our industry, nuclear test in the Pacific, the hunger in the world also... for them, nuclear industry is an evil activity and everybody working in it is a bad person that want to build bombs and irradiate people. Many NGOs leaders think like that. How do you want to dialogue?"

A former executive director of the mining section explained to us the historical background of anti-nuclear protests in France. According to him the anti-nuclear sentiment among sections of the French population became more pronounced when the government launched the 'Superphenix' project in 1976 which was a prototype plant dedicated to the development of a new generation of nuclear reactors. The decision was taken without any dialogue and consultation with civil society actors despite protests by more than 60,000 people on the plant site. The protests also turned violent culminating in the killing of a young activist by police and injuries to hundreds of protestors. For anti-nuclear activists in France the protest marks a symbolic event in the nuclear debate but also showed the staunch unwillingness of French governments to ignore civil society concerns about nuclear energy.

(Corporate manager, n°16, case A)	"At the beginning, civil society felt unconcerned by the nuclear power industry, but it begun to be considered very positively during the petroleum crisis of 1973. People appreciated when they started to be unwilling to pay their fuel bill. The nuclear industry was a promise of independency and people agreed. However, the nuclear industry was often accused of secret, which was not totally wrong because at the beginning the civil nuclear power and the military nuclear power were intrinsically merged. In the late 70 and the early 90, civil society started to contest this industry. They were violent and we, as members of the Cogema Company, did not know how to react, we were not used to this. So, we thought:" they are stupid, they don't understand what we are doing" and the dialogue with society, which was never very developed, was totally stopped until the early 2000."

The main argument against nuclear energy is about the environmental risks and dangers posed by the industry especially the inability to contain radioactive proliferation. Even countries that do not have nuclear plants can be adversely affected by radioactive contamination from nuclear accidents in neighboring countries. The second criticism is about the long-term handling and storage of radioactive waste. At present there is no technology that can treat radioactive waste to make it less dangerous and several activist groups do not share the optimism of the scientific community that science would find a way in the future. However, the French government certainly shares the scientific community's optimism as reflected in the government's decision tin 2006 to allocate a radioactive waste storage area that can be accessible in the future once a technology to recycle waste is developed. Opponents of nuclear power also point to high costs and scarcity of uranium. Estimates of world uranium reserves vary and range between lasting for 42 to 150 years, even up to 300

years given technological advances in the recycling of atomic fuel. Recycling of atomic fuel might appear to be a sustainable option but for concerns about proliferation – the recycling process uses Plutonium, which is a raw material for nuclear weapons. High raw material costs and expensive recycling processes may affect the growth of the industry in the medium and long term. Nuclear fuel prices have remained relatively low and stable and was seen by the company as a competitive advantage, for the moment at least. Civilian and military nuclear industries have always been closely guarded and even civilian reactors produce enough radioactive waste that can be used for nuclear weapons. Western governments are also suspicious of Iran and North Korea's plans to build civilian nuclear plants because of the potential for military use of radioactive waste.

According to respondents, there are differences in the extent of influence wielded by antinuclear activists depending on the nature of governments and civil society in different countries. For instance, the anti-nuclear lobby was successful in shaping public opinion and government policy against nuclear power in Germany, Belgium and Sweden. However, in France successive governments have been reluctant to initiate a public debate on nuclear power. For example, in 2007 the French government launched a national democratic debate called 'Grenelle de l'Environnement' on environmental issues such as energy, water, waste, biotechnology and agriculture. However, President Sarkozy specified that nuclear power generation was not part of the discussion despite calls from several environmental organizations for a debate on the merits and risks of nuclear power. While most anti-nuclear activists in France claim they are powerless because the government refuses any debate on nuclear power our sample respondents did not share this view. Rather, they felt that anti-nuclear activists apart from being a 'nuisance' had the potential to influence public opinion and were a threat to the French nuclear industry.

Passive stakeholders

According to respondents passive stakeholders group comprise the largest stakeholder group, which is the general public excluding anti-nuclear activists. Studies commissioned by the company show that 80% of the French public does not have a clear opinion on nuclear power generation and their lack of opposition was seen as tacit approval for the industry.

Respondents	**Illustrative Quotes**
(corporate advisor, n°61,	"Most people don't have any opinion about nuclear. They just want to

case A)	leave in peace, not pay too much their electricity bill and that it. It is not because they don't care, I think it would be a false analysis of their passive attitude, but they are not informed, they can't really take a position."
(Plant director, n°79, case 2)	"Nuclear power has always been a political and military matter, not a citizen's one. When you ask to people, they often don't know, they start to ask you more questions than give you answer. They are afraid about nuclear accident and have been chocked by Chernobyl, but they don't feel as it can happen in France. And you can be sure that if it happens in France, it will be a really bad time for us, maybe the end."

The company surveys also showed that public opinion in France is not based on technical knowledge about the nuclear industry but more on 'ideological and political assumptions'. This so-called passivity of French citizens must be treated with caution because opinions could shift dramatically if a serious nuclear accident occurs. Debates about the safety of the nuclear energy industry intensified in the aftermath of the Three Mile Island and Chernobyl accidents and several civil society organizations drew public attention to the non-transparency of the industry, the risks it poses and the non-democratic modes of governance of the industry. In France, public trust in the government's handling of nuclear accidents fell significantly after Chernobyl when in an effort to quell rising concern about contamination from the Chernobyl fall out the French public were told that radiation stopped miraculously at the French-German border (D'iribarne, 2007). Respondents in the study did not take the passive stakeholder group for granted and were aware of its potential to become a threat to the industry

The passive stakeholder group can thus become active if nuclear accidents occur and the public is exposed to serious health risks. They can then demand a change in nuclear energy policy from their governments. Managerial perceptions of different stakeholder groups are summarized in Table 3. In the next section we will describe how managers respond to perceived stakeholder interests and what kinds of strategies the company develops in order to address stakeholder concerns while ensuring the financial viability of the company and the industry.

Stakeholders groups	Nature	Identified	Attributes
Supportive stakeholders	International Institutions Governments (with few exceptions) Scientific groups NGOs and non-profit organization specialized on nuclear energy	International Monetary Fund World bank United Nations, UNSD GIEC European Nuclear society France, US, Russia, England	Size : medium group Power : high power with international capacity
Obstructive stakeholders	NGOs and non-profit organization Environmental activists Government (Germany, Belgium, Sweden, Austria)	Greenpeace Sortir du nucléaire No2nuclearpower Nuclear free The Atomic mirror Don't waste Friends of the Earth	Size : small Power : variable, depending of theirs ability to mobilize passive stakeholders
Passive stakeholders	Citizens	French citizens	Size : large and diffused group Power : high but often not used

Table 4

Managerial perceptions of stakeholder groups

Corporate stakeholder and sustainability strategies

How do managerial perceptions of their organization's stakeholders translate into corporate strategies and actions in the context of sustainability? Managers saw the current preoccupation with sustainable development at the institutional and societal level and concern about climate change as a business growth opportunity for the nuclear industry. Portraying nuclear energy as a sustainable energy option was also seen as a way to enhance the reputation of the industry which was under attack from anti-nuclear activists as the following quotes illustrate:

Respondents	**Illustrative Quotes**
(Plant director, n°79, case 2)	"The main idea is to communicate on CO^2-free energy generation. This is a reputation stake and we needed to have a social acceptation to pursue our activities."
(Sustainable development manager, n°1, case A)	The current energy model is focus on fossil fuel generation. But we will need to change it and the nuclear power generation appears as a sustainable solution to answer to a part of the growing energy needs. Furthermore, the key issue of the century is the global warming and nuclear do not produce greenhouse gas, so it doesn't contribute to global warming. It's for that reason that sustainable development is a major opportunity for us."
(Strategy director, n°8, case A)	I would say that it is an unbelievable opportunity because sustainable development which was traditionally considered as opposed to nuclear will be our best ally because of global warming. If we apply the logic further, we could say that nuclear power generation is the solution to environmental issues."
(Quality coordinator, n°9, case A)	"For us, I think above all that it's a strategic approach with huge business opportunities."
(R&D director, n°84, case 2)	"We say that nuclear power is a clean energy which does not produce CO^2. It's an original idea from our president to enhance nuclear reputation because the public opinion is very sensitive on this subject."
(Plant director, n°124, case n°3)	"The fact that the corporation makes sustainable development the focal point of the group's industrial strategy is a very important thing that allows considering differently the nuclear power industry. Associating sustainable development with nuclear is well done in terms of corporate reputation and marketing. It's very good to communicate on it."

Implementing a 'sustainable growth' policy was therefore a strategic issue for the company. However, the way they could address sustainability issues was strongly constrained by the corporate perception of the environment. Respondents described the political, economic and social environment of the nuclear industry as being 'unstable' and 'volatile'. The corporate response to instability and volatility could be described as cautiously conservative mirroring responses made by individuals in groups when they face uncertain situations – risk-taking behavior tends to be minimized and conventional actions are reproduced (Michalon, 2002). In this case the company reduced its risk by publicly committing to sustainable development and developing social and environmental reporting initiatives while continuing its growth strategies. The corporate approach to sustainable development allowed it to preserve its traditional business model and precluded any radical shift in strategy, which could risk alienating its supportive stakeholders or providing more support to the anti-nuclear lobby. Public espousal of the principles of sustainable development and its translation into sustainable growth were consistent with the views of the general public that allowed the latter to remain passive. This need for reducing stakeholders' perceptions of risk is illustrated by the following quotes:

Respondents	**Illustrative Quotes**
(communication director, n°5, case A)	"We don't have any right to make mistake, we cannot afford to fake anything because NGOs are watchdogs and just wait for this "faux-pas". If there is any difference between what we say and what we do, the whole industry would be accused and put in danger. For us, it is also a reputation stake, with only one mistake, all what we built before will be destroyed. You have to remember that some of our stakeholders' job is only to fight again our industry until death. That situation obviously obliges us to be more rigorous and careful than others."
(Partnership coordinator, n°19, case A)	"We always remember that our survival is linked to the social acceptation of nuclear power generation. We are at the mercy of public opinion. If people say no to nuclear power, it's over. The nuclear power sector knows that it faces a high risk and the social acceptation is a crucial issue."
(Operational manager, n°128, case 3)	"The crucial issue is risk management. Today, the nuclear is considered risky, so we are very sensitive about social trend and public opinion variation."

(Institutional relations manager, n°16, case A)	"Sustainable development is not a funny and trendy concept; it's an obligation for corporations like ours. The social acceptation is very important; it is a survival condition for our group."

To avoid any risk taking and benefit from the new business opportunity, the company had made a public commitment to sustainable development and implemented a 'sustainable growth' strategy, which involved pursuing economic growth while taking into account the environmental and social impacts. The organizational translation of this sustainable growth goal was made through a new management system consistent with the 'triple bottom line strategy and the Global Reporting Initiative Management tool (GRI). A global reporting system was developed by the corporate headquarter that provided guidelines to subsidiaries' managers to report on economic, environment and social aspects of their business. For example, one strategy was about 'reducing consumption' and the company identified a four step process by which this could be achieved. All units were asked to report their progress toward the four steps and develop progression plans. The ones that were able to achieve the last step received recognition from the board:

1) The plant reduces the consumption of resources on which it can immediately realize a significant cost-reduction.
2) The plant makes a strategic environmental analysis to define its entire environmental impact.
3) The plant implements a systematic eco-efficiency process (cost analysis, energy efficiency, and alternate processes) and sets an annual action plan with performance objectives.
4) The plant uses life cycle analysis and invests in R&D to optimize its consumptions. Suppliers are selected according to the plant's need to improve the environmental performance of its products and manufacturing processes. The plant communicates the improvements to its stakeholders.

Every subsidiary is expected to follow the same guidelines and use the same tools to assess performance. However, on further probing most respondents explained that this new global management system was not an innovation for the nuclear power sector because it has always been very cautious about environmental issues as the following quotes illustrate:

Respondents	Illustrative Quotes
(Sustainable development director, n°1, case A)	« It was not a revolution but an evolution. It was important for us to maintain ours previous way of doing and show to people that it was only an improvement of the existing management system. I don't want to talk about change. Change scares everybody. We wanted employees to understand that they were doing that before and sustainable development was only to go a little bit further in the process."
(Plant director, n°52, case 1)	"For us, it was not a real change. We have always been very careful about social and environmental issues. The good thing with sustainable development is that this work is now recognized by both external and internal actors."

Then, the commitment to sustainable development did not fundamentally change the business model of the company. It only reinforces the company's existing environmental policies (dictated mainly by the regulatory agencies). Eco-efficiency is not the same as sustainable development and despite its commitment to environmental sustainability when it came to actual practice decisions were driven more by 'efficiency' then 'eco'. The new environmental reporting system was communicated to all stakeholder groups as part of a 'sustainable growth' strategy. The company's environmental strategy was thus complemented by a stakeholder management strategy in an attempt to enhance the company's social legitimacy. The strategic focus was on the obstructive and passive stakeholders – to the former group they attempted to portray nuclear power as a clean energy source and to the latter they stressed the safety and risk management policies of the company to prevent any shift in public opinion. Despite the affirmations of the triple bottom line approach in balancing economic, social and environmental issues to achieve 'sustainable growth' in practice the focus was on sustaining growth. We will discuss two examples that illustrate how economic and profit motives continued to dominate decision making on environmental issues.

The first case involves toxic acid dumping. Many subsidiaries use toxic acids in their production chain and produce substantial quantities of toxic waste. One plant invested in R&D to identify ways to recycle toxic acid waste and developed an innovative process that allowed it to recycle 80% of the waste, which could be used for production. This innovation was eco-efficient and led to significant reduction of toxic acids dumping. However, two other plants that used similar toxic acids did not implement the recycling process but instead

constructed a chemical station where the waste was treated to reduce its toxicity before releasing the treated waste into the nearest river. This process did not reduce the dumping of acid waste but only the level of its toxicity, which was sufficient to meet regulatory standards. When asked why the recycling process which their own company had developed was not used in all its plants managers cited high costs and inadequate returns on investment as the following quotes illustrate:

Respondents	**Illustrative Quotes**
(Laboratory coordinator, n°125, case 3)	« Yes I know they did a great thing with their recycling process. Acids release is a real impact for our kind of plant. But we do not have enough acid release to invest in this process. It's very expensive and it's not interesting for us. Now, you're right, it's better to recycle but it will be always costly, from building to maintenance."
(Chemical station manager, n°123, case 3)	"I know this innovation, they retreat acids and reinsert it into the production process, aren't they? Good. But here, it is not a priority. Too expensive and no real return on investment. We try to respect the law by mixing acids before releasing. But the process is not reliable, we still have problem with legal limits. I would be happy to have the same recycle process but they will never accept."

So in essence the implementation of the recycling process is limited to plants where cost reductions can be achieved, otherwise conventional treatment of waste continues to be practiced.

Another plant manufactured a product that contained SF6, the most potent greenhouse gas with a global warming potential 22,200 times greater than carbon dioxide. Corporate headquarters directed the plant to reduce gas emissions to be consistent with the company's policy on clean energy and to comply with environmental regulation. The plant responded by conducting a life cycle analysis of the product in an attempt to reduce the amount of gas used in the final product since no substitute existed. However, in practice no real reductions resulted because of the difficulty to translate sustainability strategy into practice as explained by a technician:

Respondents	**Illustrative Quotes**
(Technician, n°97b, case 2)	"We have more and more constraints. We must think to the product cycle of life and try to reach a 100% recycling. The group communicated a lot on this topic during the last years. We also

	created an environmental guideline to conduct life cycle analysis on our products."

The 'constraints' identified by the technician were really at the heart of the company's environmental policy. The life cycle approach widely promoted to their stakeholders as one of their company's major environmental initiatives involved first asking each plant to identify toxic and polluting raw materials that would be used for life cycle analysis. Then the engineering department was asked to come up with technological solutions and alternatives while taking into account environmental impacts over the life cycle of the products. However, the guidelines stipulated that life cycle comparisons could only be done on products that had similar costs. If cheaper alternatives existed they were invariably preferred. The company's environmental manual stated:

> " [The goal] is to conceive new products by minimizing their environmental impacts on environment if it is technically and economically feasible. […] Environmental criteria will be used to choose between two options that are technically and financially equivalent". [Operational instructions for conception, case n°2)

Thus, in practice the use of life cycle analysis to assess the environmental impact of products and implement the company's sustainable growth strategies privileged the environment only when it was 'technically and economically' prudent to do so. While the engineers interviewed were all aware of the company's new focus on sustainable development and the need for more sustainable products they also pointed out that ultimately their choice of raw materials was dictated by customer preferences and willingness to pay a premium for a less environmentally harmful processes:

(Operator, n°92a, case 2)	"We use a greenhouse gas and each product is equipped with sensors that allow a constant control. But if there is a breakdown on a sensor, we need to change it and traditionally, we use to open the system and the gas escapes a little bit when changing the sensor. Now we put a valve on the sensor to be sure that the gas does not escape. But this is an option; customers have to pay more for that, so they do not systematically ask for this technology."
(New product manager, n°84, case 2)	"Sometime customers ask for environmental information when asking for a call of offers, but I must be honest, it is rare, they always look after the price firstly, no matter the environment will be impacted."

Some respondents even claimed that the company positioned some manufacturing changes as being environmentally motivated when in fact they were driven by cost concerns. Engineers were instructed to reduce costs by using less material and inputs in new product development. The subsequent reduction in input was then claimed as an environmental improvement. While there is nothing inherently wrong in this win-win approach using cost advantages as a primary motivator limits the extent of environmental improvements that are really possible as the following quotes illustrate:

(Engineer, n°90, case 2)	"Taking into account environmental impacts remains theoretical. The environmental guideline mentions it but in practices, it is not the case. Technically, we have the logical to compare solutions in terms f environmental impacts. But, we don't do it. Because of cost reduction, we always do better than before; there is less raw material, less expensive material, so it is good for environment and people around think that it is environmentally conceived. It is not true. We think in term of cost reduction and then there is a raw material consumption's reduction, so it is always better than before. But if environment was really taking into account, I think that many thing could change."
(Vice plant director, n°80, case 2)	"The goal of conception (life cycle analysis) is to reduce the manufacturing price. That's it."
(New product director, n°84, case 2)	"It won't be honest to say that it is for sustainable development. We have the idea, we need to reduce manufacturing cost and we understood that it was in line with the corporate sustainable policy."

Figure 1 describes managerial perceptions of stakeholders and the resultant corporate strategies.

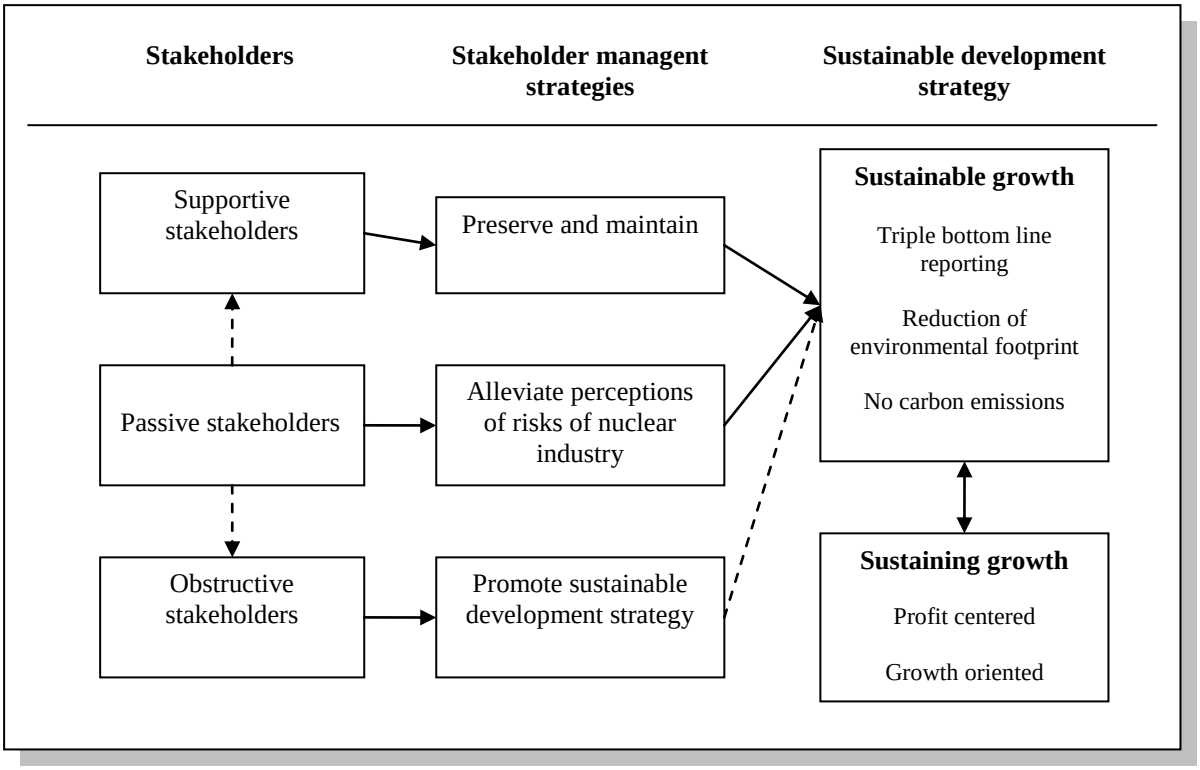

Figure 1

Stakeholders and corporate strategy.

Discussion

Our analysis indicates that despite espoused claims about the transition to sustainable development there was no significant shift in the business model of the nuclear energy group we studied. Environmental initiatives were invariable evaluated using traditional criteria cost reductions, efficiency gains and customer preferences. Our findings are consistent with other empirical studies in other industries where the ultimately the economic bottom line determines the scope and extent of environmental and social initiatives (Banerjee, 2001; Banerjee, Iyer & Kashyap, 2003; Margolis & Walsh, 2003). In this case strategic engagement with supportive stakeholders involved highlighting the business and growth opportunities of the nuclear industry because of rising concerns over greenhouse gas emissions. In engaging with the passive stakeholders the company sought to reassure them of the safety risks of nuclear energy while also highlighting the 'clean' aspects of nuclear energy. Obstructive stakeholders were presented with the company's new sustainable development agenda publicizing their environmental and reporting initiatives, their commitment to reducing their environmental footprint and better technologies to reduce radioactive waste. The strategy of 'sustainable growth' was designed to please all stakeholders although the company was aware

of the potential for public opinion to shift, government policies to change and anti-nuclear voices becoming more strident and powerful.

However, sustainability in this case was very much restricted to a 'win-win' discourse although the reduction of environmental impact was minimal. Win-win situations involving the environment and business are not so obvious and frequent (Banerjee, 2007). Attracted by cost reduction, production efficiency and new markets, companies commit to environmental strategy and are soon confronted with dilemmas. Green management can be very expensive; re-treatment station buildings, recycling process implementation or R&D investment involve significant costs. Moreover, managers have to make technological choices between environmental efficiencies and costs. If cost reduction is the corporation's key motivation to implement green management managers will tend to choose the cheaper solution despite of its lower environmental efficacy. Our analysis suggests that the firm we studied committed to environmental issues in order to benefit from the business opportunities coming from sustainable development. In areas where business interests coincided with environmental improvements, the firm's developed and implemented environmental strategies.

The sustainable growth strategy in the case we studied was really a sustaining growth strategy. It was about leveraging current concerns about greenhouse gas emissions to expanding the use of nuclear power by promoting it as a clean source of energy while alleviating public concerns about safety. The growth strategy was further reinforced by assessing environmental initiatives by economical and technical criteria and only allowing those initiatives that do not increase costs to be implemented. There was no meaningful attempt to redefine the company's business based on the sustainability agenda. Despite low key (and ultimately unsuccessful) attempts to invest in the renewable energy sector the company saw itself as a nuclear energy provider and sought to expand their operations world wide. What is interesting in this case is that the company's majority shareholder is the French government who vetoed any attempts by management to invest in renewable energy because it was too costly and impractical. Thus, in the current political economy economic growth and expansion is privileged over environmental and social concerns whether it is by a multinational corporation seeking to enhance shareholder wealth or a publicly owned company seeking to expand its profits and revenues. Wealth is created and revenues are generated not through sustainable growth but by sustaining growth. The company's major goal of 'reducing consumption' for each plant per unit of output will not reduce environmental impacts in any meaningful way because any reduction will be nullified by increased output and sales as the industry expands.

While the study has obvious limitations in terms of its generalizability of findings from a single case study it does highlight the limitations of the enlightened self-interest view of sustainable development by showing that business interests are the primary driver of environmental strategies and that there is no fundamental change in the traditional business model when it comes to addressing sustainability challenges. Business opportunities linked to green management have been widely promoted in the literature (Porter et al., 2001; Wiedemann-goiran, Perier, & Lépineux, 2003). Both in the business and academic press there are scores of articles that exhort all businesses to embrace sustainable development because not only can such an approach save the planet it can also improve the company's financial and economic position. These writers predict that by becoming environmentally responsible firms can leverage competitive advantage, generate cost savings through process-oriented green management and build a good corporate reputation.

However, some caution must be advocated for the promotional campaign for sustainability in business firms. Our analysis shows that self-regulation based upon business interests can fail in achieving the goal of sustainability. Corporations will not escape from an economic logic and will apply the same business models to sustainability. More research is needed to understand the long-term effects of a particular environmental initiative. Most research has focused on the win-win cases of environmentalism. Once the low hanging fruit of energy efficiencies, waste reduction and recycling are picked, companies are confronted with environmental initiatives that no longer provide immediate economic and financial benefits. How do managers' negotiate tradeoffs in a win-lose situation? What are the decision-making criteria that are used? How are these communicated to external and internal stakeholders? We need more research that highlights decision-making processes in trade off situations.

Our findings have some implications for change in the nuclear power industry. First, it shows that nuclear power corporations are highly constrained by external stakeholders. Direct engagement with the corporation by obstructive stakeholders may be less effective than attempts to convert passive stakeholders to take a stronger stance against the expansion of the nuclear sector. Second, the geopolitical context of nuclear energy is a significant factor for the future of the industry. Recent trends in European elections indicate a shift in the political climate with green parties making inroads in the European Parliament and in several countries in Europe. Green parties won 53 seats in the European Parliament and increased its representation from 5.5% to 7.2% in the assembly. Increasing political power among green parties could well see significant policy shifts away from nuclear energy to renewable energy

sources. Ultimately how these stakeholder dynamics play out in the political economy will determine the direction of the nuclear energy industry.

The planet finds itself at a cross roads in terms of developing sustainable energy solutions. Much of the attention is focused on reducing greenhouse gas emissions from conventional energy sources. And despite the rhetoric both investment and technological developments in renewables are modest and limited in scope. How the energy industry is governed remains one of the most crucial challenges of sustainable development. Our findings indicate that green regulation matters more than green management in developing policies for environmental protection. Future research can explore new forms of legislation involving both 'hard' laws that corporations have to comply with and 'soft' laws or codes of conduct, environmental standards, environmental and social audits. While 'soft' forms of regulation are discretionary perhaps constant monitoring and scrutiny of corporate environmental impact by civil society actors can serve as another form of regulatory pressure that compels companies to make meaningful progress towards environmental protection. Thus, what is needed is not just green management but green governance involving the active participation of market, state and civil society actors to ensure that corporations do not stray from the path towards sustainability.

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