



3rd International Conference on Energy and Environment Research, ICEER 2016, 7-11 September
2016, Barcelona, Spain

Benefits of Scenario Planning Applied to Energy Development

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Abstract

Scenario planning was first used effectively by Royal Dutch Shell approximately 40 years ago. The company recognized that efforts to predict exactly the future are unlikely to be very successful. The premise of scenario planning is that organizations look at possible future trends and project several possible futures (or scenarios). The intent is to project enough such scenarios, even unlikely ones, that they “bracket” possible futures. This enables one to assess the ability of their policy, process, or design to perform positively within any of the scenarios and thus represent a truly robust choice. This paper briefly describes some examples of use of scenario planning within the energy sector, as well as some unusual factors that may influence the outcomes.

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Peer-review under responsibility of the scientific committee of the 3rd International Conference on Energy and Environment Research.

Keywords: planning; scenarios; energy; uncertainty

1. Introduction

Scenario planning arose from a recognition that one could not predict the future with any accuracy at all. Its first use was by Royal Dutch Shell [1] over forty years ago, and it has been widely and effectively employed in many arenas to look at a possible range of actions and the resultant impact on policies, designs, and the like. The intention is to anticipate future possibilities in such a way as to develop the most robust plans, designs, and policies leading to sustainable solutions [2] [3]. The purpose of this paper is to broaden exposure of the use of scenario planning to additional audiences. While this powerful tool is being used by growing numbers of corporations, it has been used very little in policy formulation and monitoring. Given the inability to predict the future with any certainty, it is

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critical to consider various plausible futures against which to measure one's programs. While research leading to this paper has not developed new techniques, it did identify the lack of use of existing techniques by policy-making bodies.

2. Rationale for use of scenario planning

There are many historical examples of the failure of traditional predictions. Of more current interest is the severe drop of oil prices. Venezuela, which holds the world's largest petroleum reserves is noteworthy because of their excessive reliance on income from oil exports. Numerous predictions of oil prices to 2050 ranged from \$95 to almost \$150. If Venezuela had engaged in scenario planning, perhaps they would have taken some steps in other strategic directions. For example, low oil prices could encourage development of a broader industrial base.

In the field of sustainable development, including energy, there are numerous areas of uncertainty to be considered. These can include, as a minimum, the following: changing environmental regulation; technology improvements; variation in energy prices; impacts of climate change; and political changes. Among social issues, one could list such items as increasing population, with a shift to an older population, increasing income equality, disparities in health care, and increasing migration. Technological changes include improving and pervasive internet and social media access, falling costs for renewable energy sources, increased uses of nanotechnology, and improvements in health care, although access to such is not uniform. Economic impacts can be seen through shifting job markets and relocations, outsourcing, the European Union, and displacement of workers and movement toward service and knowledge sectors. Environmental issues take many forms, as seen in many cities suffering from air pollution and trying to decrease urban automobile travel, availability of clean water not uniform, and energy access spotty in some regions. Of course, the problems due to climate change exacerbate many of these issues. Politics and political change create some uncertainty, and growing stresses due to terrorism and migration are of increasing concern as global alliances shift. Scenario planning uses an outside-in approach, from external (little if any influence) to internal (more control). The process is intended to break down barriers and change the dialogue in strategic discussions. It further enhances organizational learning, in which the organizations continuously learns about itself.

3. Scenario planning process

The focus of the scenarios depends upon the organization developing them. For example, Shell is looking for its future. The World Energy Council is looking at the entire world, with results also for regional differentiation.

In each case, as scenarios evolve, there are several types of futures [4], including the following:

Probable: This is largely a projection using current trends; Plausible: This includes scenarios to be developed by processes to be indicated and significantly increases the range of outcomes; Possible: These include events that outside ordinary expectations. These include events such as disruptions (including disruptive technologies), black swans, wild cards or surprises like the Fukushima incident; Preferable: This what the organization would prefer. For the scenarios, those doing the planning are trying to answer the question "What might we need to do?" The same is true for those asked to add their experiences and thoughts. Fig. 1 illustrates this process. McKinsey and Company [5] has listed some positive reasons for scenarios, as well as some traps, as follows:

- Powers of Scenario Planning: Expand your thinking; uncover inevitable to near-inevitable futures; protect against groupthink; and allow challenging the conventional wisdom.
- Common Traps: Do not rely on excessively narrow set of outcomes; do not use a single variable; do not become paralyzed by findings; and do not discard scenarios too quickly.

McKinsey [5] also recommends, as do most, a minimum of four scenarios to assure that the organization fully understands the uncertainties over the entire range of possible outcomes. Ragland [6] lists items to beware as well. Included in his listing are the following to avoid: overestimating the ability to control the future; accepting expert opinions blindly; not taking the time to do a good analysis; not adding enough pairs of "innocent" eyes; and being controlled by the tyranny of the present.

There are several ways to craft scenarios. Two methodologies, combined, [4][7] follow these steps: Identifying the focal questions or issue(s); Environmental scanning – external and internal; Brainstorming critical events; Selecting drivers of change and ranking them; Describing the trajectories of critical events; Determining

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