Journal of Analysis and Computation (JAC)
(An International Peer Reviewed Journal), www.ijaconline.com, ISSN 0973-2861
Volume XVIII, Issue II, July-December 2024

REVIEW ON INFRASTRUCTURE AND ENERGY CONSERVATION

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ABSTRACT

The primary forces behind economic growth and the maintenance of a high level of employment are energy and the entire infrastructure that surrounds it. Here, as part of a larger study on the global energy industry, we assess how technological advancements have affected the condition of the energy infrastructure. The global issues that the energy business is currently facing are thoroughly examined in this paper. With an evaluation of the entire energy system, we offer scenarios for the development of a modernized energy infrastructure. Our evaluation indicators are chosen based on the energy infrastructure's dependability, quality, potential for accidents, and associated environmental concerns. This study is especially well-suited for predicting the essential actions (of a technical nature, of governance)

Keywords- Energy, Environmental, Modernized, Deterioration.

[1] INTRODUCTION

By using fewer energy services, energy conservation aims to cut down on unnecessary energy use. This can be accomplished by shifting energy sources or making more efficient use of existing ones. The act of using less services (for instance, by driving less). Through energy efficiency, which has a number of benefits, including a decrease in greenhouse gas emissions, lower carbon footprint, and cost, water, and energy savings, energy conservation can be accomplished.

Energy conservation is an essential factor in building design and construction. It has increased in importance since the 1970s, as 40% of energy use in the U.S. is in buildings.

Recently, concern over the effects of climate change and global warming has emphasized the importance of energy conservation.

Energy can only be transformed from one form to another, such as when heat energy is converted into vehicle motive power or when water flow's kinetic energy is converted into electricity in hydro electric power. However, machines are required to transform energy from one form to another. The wear and friction of the components of this machine while running cause losses of very high amounts of energy and very high related costs. It is possible to minimize these losses by adopting green engineering practices to improve the life cycle of the components.

Energy conservation day has been celebrated on December 14 every year since1991.Energy can be conserved by reducing waste and losses, improving efficiency through technological upgrades, and improving operations and maintenance. Energy conservation can be accomplished by changing users' behaviors through user profiling or user activities, monitoring appliances, shifting load to off-peak hours, curtailing devices. And providing energy saving recommendations. Observing appliance usage, establishing an energy usage profile, and revealing energy consumption patterns in circumstances where energy is used poorly, can pin point user habits and behaviors in energy consumption.

Fig.1 Energy Conservation

Appliance energy profiling helps identify in efficient appliances with high energy consumption and energy load. Users can check appliance-wise energy usage before deciding on action for energy preservation, either curtailing these appliances or shifting to an off-peak hour. Seasonal variations also greatly influence energy load, as more air-conditioning is used in warmer seasons and heating in colder seasons. Achieving a balance between energy load and user comfort is complex yet essential for energy conservation. On a global level, energy use can also be reduced by stabilizing population growth.

[2] METHADOLOGY

Fig.2 Steps of Delphi Process

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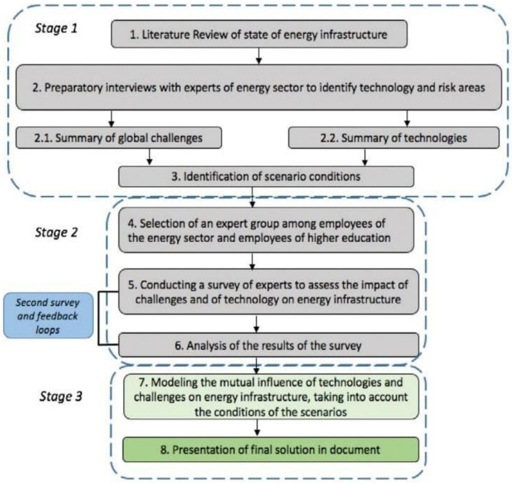

The scenario planning began with an analysis of the external environment of electric power enterprises and was followed by the identification of the main factors affecting the enterprises and the industry. The analysis of the external environment of the industry results in the compilation of a list of macro environmental factors that, in the considered time period, have

the greatest impact on the activities of the organization. The next step is the development of scenarios. This stage includes: - the selection of influencing factors; - the forecasting of the various potential outcomes of scenarios; - a combination of significant factors leading to the formation of scenarios. To select the pertinent factors, it is recommended to rely on the results of the analysis of the external environment in order to identify the most significant factors that will form the consolidated basis of the scenarios. We chose the brain storming method in order to optimize the identification of the most significant factors, with the utilization of cause–effect diagrams. The result of this should be the one selection of several of the most significant and independent factors.

The stage of forecasting various outcomes of scenarios is based on the analysis of the identified factors and on the compilation of several of their outcome options. The purpose of the combination of the most significant factors is to establish the interdependence between the predicted outcomes of the factors under consideration, as well as to write scenarios. Next, it is required to combine the resulting mini-scripts into several large scripts. At the same time, as the opinions of researchers differed regarding the question of the required number of scenarios, we proposed to develop two main scenarios, including all favorable outcomes of key factors in one scenario (positive), and negative outcomes in another one (pessimistic scenario). This having being done, it becomes then mandatory to assess the plausibility of the scenarios and, if necessary, to eliminate options for outcomes that are not possible This method is widely used in planning scenarios in the energy sector. It involves the generalization of all individual expert assessments regarding one situation. The Delphi process was split into three phases and five steps:

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Year	Energy policy
1988	The Companies Act stressed the importance of disclosing the particulars on energy efficiency, such as energy consumption, value added, and the amount of major products for 3 years
1991	India liberalized the regulatory regime in India to promote industrial competitiveness. The objective of this reform was to increase market-based competition
1995	The Government of India adopted a policy to promote energy efficiency in the country by allowing the accelerated depreciation for energy efficiency and pollution control equipment
1997	Capital investment in industrial energy efficiency totaled $12 billion
2001	The government identified certain energy-intensive industries as designated consumers brought under The Energy Conservation Act, and gave a period of 5 years for those energy-intensive industries to comply with a number of mandatory provisions. These include: (1) establishing norms for energy consumption; (2) mandatory energy audits by accredited energy auditors; (3) establishing efficiency standards and labeling; (4) mandatory appointment of energy managers
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Fig.3 Energy Policies in India

Energy Policies in India

In India, energy efficiency policy and investment in industrial energy efficiency are regarded as important issues. Energy demands in India will increase by 150% in the next 15 years. A number of energy efficiency polices have been developed and implemented in India. These policies include:

1. Pricing policy
2. Institutional development policy and
3. Energy efficiency technology policy.

In 1997, these policies have attracted over $12 billion of capital investment in energy efficiency in the industrial sector. Some policies, for example disclosure of energy efficiency particulars and mandatory appointments of energy efficiency managers and professionals at the industrial enterprises, have greatly facilitated energy efficiency in the industrial enterprises.

Energy Policies in NETHERLANDS

In the Dutch Long-Term Agreements(LTAs),voluntary agreements between the Dutch Ministry of economics and industrial sectors consuming more than1 petajoule(PJ)per year and covering 90% of Industrial energy consumption were established and aimed at reducing CO_2 emission from 3 to 5% in 2000 compared to 1989s level and improving industrial energy efficiency by 20% in 2000 compared to 1989.This policy ended in 2000 with an average improvement in energy efficiency of 22.3% over the period 1989–2000 Due to the comprehensive process management by the Dutch energy agency NOVEM(now Senter Novem), these agreements can be regarded as European best practice. The Ministry of Economic Affairs provided a great deal to support the industries that implemented this policy including tax rebates for energy-efficient investments, subsidies, detailed audits of industrial facilities (including an inventory of energy-consuming equipment, assessment of energy use, and identification of cost-effective energy-efficient investments) and coordination of regulatory measures aimed at energy efficiency in industry. Following the previous policy on energy efficiency in Dutch industry, a new policy has been developed forth energy-intensive industries. In the new policy, industry groups agree to strive to be among the world's most energy-efficient producers by 2012.The policy will use bench marking of regions(with a similar production capacity as in The Netherlands) to monitor and verify the results.

[3] EMPIRICAL RESULTS AND DISCUSSION

The timeline revealed several elements that impact energy consumption:

• In-store thermal comfort: after the observations and the interviews, it became apparent that the store has very little control over the most energy consuming elements, such as heating and cooling, or lighting; the control of these is outsourced to accompany that monitors and adjusts the energy performance. In some cases, this leads to additional energy consumption: for instance, staff at the customer services desk located next to the main entrance would use an electric heater if it is cold outside and the doors open frequently.

• In-store energy consumption: there are however elements in the store that are controlled by the employees. For instance, the ovens must be switched of once the required number of chickens are grilled; however, oven soften stay on until someone would switch them of in the of the day (ornotat all).

• Daily patterns: Fridays and Saturday(and in particular 'Fivestar' weekends ,i.e. those just before a holiday) are considered to be the busiest days, and they differ significantly from a week day operation of the store as there is a constant high few of customers throughout the day and in the evening. Consequently, the shelves are restocked more frequently (particularly those where seasonal items are)—and it is important to note that both

Under-stocked and overstocked fridge shelves have an impact on the efficiency of energy consumption; and thus,a store employee could potentially play a role in reducing it.

Energy consumption vs. convenience:

Convenience is about simplifying and enhancing the shopping experience— it determines where, when, why, what, and how — and is implicitly linked to profit. Convenience is a subjective characteristic(e.g.whatmaybeperceivedasa'convenient'locationofaparticularshoppingitem by one person may not be 'convenient' for another). The participants have debated around convenience extensively and were indecisive. Whilst they felt it would be convenient to have fruit and vegetable at the entrance, they also agreed that such proximity to the outside environment(e.g. sunlight, hot/cold temperatures)would have a negative impact on the produce.

Another suggestion was to put bakery at the front as the customers may find the smell attractive—but in this case, the participants felt here might be implications for the energy consumption. It was then suggested that putting the newspaper stand next to the door is energy efficient(as the temperature is not important for Energy Efficiency(2021) but at the same time, it may not be as attractive.In addition , news papers/magazines are often a spontaneous purchase that often occurs while people are waiting at the checkout.

- Energy consumption vs. Professional bias:

Here, the participants' decision about the layout was affected by their daily roles. For instance, an engineer suggested that the location of the energy consuming furnishing should be co-located with the infrastructure; for instance, it was suggested to put all fridge sat the back of the store as all the pipes are there .Participants also suggested that cold and frozen items should not be next to bakery as this increases the energy consumption ;instead, fridges, delicatessen section, frozen food, and ready meals as well as meats should all be collocated in order to reduce the energy consumption. This also made sense from an energy perspective: fridges should beat the back of the store, where it is possible to turn the heating of. The professional priority however often clashed with personal bias and convenience. Moreover, there was a feeling of redundancy as participants acknowledged that it does not really matter how they arrange the design as the main energy-saving elements (air conditioning, heating, lighting) are controlled externally.

[4] CONCLUSION

This paper explored the socio-technical context within which energy consumption actors in a large supermarket given. It demonstrated the' social ordering of choices, problems and practice' by unveiling that actors' behaviour driven by convenience or profit takes a priority in decision making and highlighting that there tail environment is agency-constrained (i.e. shoppers or employees can hardly do anything individually to affect energy consumption). These tensions however are usually explored through either technical quantitative studies or behavioural qualitative studies. We wanted to make this challenge more visible. Using an experimental methodical approach — which was possible using a 'tangible table' — we showed how it can aid decision-making mechanisms by not only encouraging exchanges but also, most importantly, highlighting contradictions, which leads actors to find a consensus or instead to identify points of opposition that are impossible to overcome. By moving between virtual and real space/time, the authors were able to remove the conventional constraints associated with both approaches; we were able to visualize conficts and dependencies between employees and energy interventions, i.e. various elements of socio-technical system. Such visualization is important because it enables a clearer focus on the socio-technical system allowing for a clearer understanding of how interventions and decisions come together, which would be impossible at full scale. In other words, the key contribution of the technology.

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