



THE IMPLICATIONS OF ROADMAPS FOR PLAYERS, POTENTIAL REACTIONS, AND POLICY ALTERNATIVES FOR OVERCOMING BOTTLENECKS

Manoj Kumar Upadhyay¹, Dr. Sravan Kumar Kandi²
Department of Management
^{1,2}OPJS University, Churu, Rajasthan

Abstract

Environmental regulations governing greenhouse gas emissions from the transportation sector and from fuel production are becoming increasingly common around the globe. This is notably true in Europe, Japan, and North America. World transportation energy consumption has more than quadrupled in the last 30 years, and significant emissions reductions in the transportation sector will be required in order to achieve the worldwide CO₂ emissions reductions necessary to counteract irreversible and severe climate change. The main objective of the study is to identify similarities and differences among existing views and to propose potential hydrogen visions for India's future energy systems, investigate the consequences of roadmaps for actors, potential responses, and policy solutions for overcoming roadblocks and achieving the intended outcome. Descriptive research design has been applied in this research to address research objectives. Scenario technique has been used to explain potential future developments in a certain region. In the case of hydrogen in India, some research has been done, and a prospective comparison technique based on PESTLE elements has been employed. If one wanted to know how a business, industry, or market may evolve, the findings showed that hydrogen's usefulness as an engine fuel, based on the results of the current experimental work: By and large, hydrogen fuel is well suited for spark ignition engines and also performs well in compression ignition engines.

Keywords: *Hydrogen, Energy, Fuel, Engines, Sustainable development, CO₂ emissions*

introduction

Background of the study

The present-day electricity and transportation system, that's primarily based totally, totally on fossil electricity carriers, cannot be taken into consideration as sustainable in any sense. The endured increase in the world's population, that's predicted to grow from about 7 billion human beings nowadays to over nine billion with the aid of using 2050, mixed with the modern industrialization of growing nations, especially in Asia however additionally in South America, will bring about

accelerated worldwide electricity call for with inside the coming to a long time e with the aid of using as much as 50% till 2040, consistent with the International Energy Agency (IEA) with fossil fuels persevering with to dominate worldwide electricity use (Ball & Wietschel, 2009). While that is going on, there's a developing international consensus that greenhouse fuel line (GHG) emissions, which can be persevering with the upward thrust, should be decreased that allow you to keep away from dangerous GHG-prompted weather alternate impacts. As a result, electricity delivery protection and weather alternate are large issues concerning the destiny of the electricity enterprise, and locating the only technique to lessen emissions even as concurrently handing over the electricity vital to guide economies is a hard task.

As of now, the transportation enterprise bills for kind of one-region of the world's number one electricity intake and related CO2 emissions, with the extraordinary bulk of these emissions coming from avenue transportation. Transport is likewise answerable for around 20% of the anticipated upward thrust in each worldwide electricity intake and greenhouse fuel line emissions thru 2040, consistent with the International Energy Agency. According to the International Energy Agency, there are kinds of 900 million mild obligation automobiles on the street international (except for - and three-wheelers) at the moment, with over 2 billion motors predicted to be on the street with the aid of using 2050 (Parikh & Upadhyay, 2012). Oil is closing the maximum broadly used number one gasoline, accounting for extra than ninety-five per cent of all transportation electricity calls for. Reducing the transportation area's reliance on oil would, as a result, grow electricity protection even as additionally assuaging worries approximately the financial and geopolitical ramifications of possibly shortages with inside the delivery of oil, that's a pillar of our globalized society targeted on transport.

But the movement of people and the transportation of products is one of the most important factors driving economic growth and societal progress. As a result, lowering energy consumption and CO2 emissions from transportation, particularly personal transportation, represents a significant challenge.

Literature Review

According to the view of Reith, Wijffels, Barten, (2003) Renewable Energy Sector, the Ministry of New and Renewable Energy (MNRE) (2010) analyzed modern and potential task opportunities and advanced HRD techniques for the renewable power area. It tested traits with inside the renewable power industry, quantified present employment opportunities throughout many useful areas, and forecasted employees' necessities inside the renewable power area for the duration of the short (five years) and medium-term (five years) (five-10 years). The records for this take a look at had been accumulated via way of means of a questionnaire survey of stakeholders, in-individual meetings overview of the literature, and the gathering of pertinent facts from the United Nations

Environment Program, the International Labor Organization, and others. According to this report, renewable power (RE) generated round 10.

Stevens, (2010) stated that in 2010, wind power accounted for the lion's percentage of this capacity, observed via way of means of small hydro. In 2010, it turned into projected that the RE area in India hired 3,50,000 people, together with each direct and oblique employment. Currently, employment turned unfolded all through all foremost renewable power sectors, together with biogas, sun photovoltaic (off-grid), sun thermal (each off-grid and on-grid), wind, biomass (on-grid), and biomass gasified. In India's example, task possibilities could extra than double via way of means of 2015 (close to term) and additionally via way of means of 2020. This takes a look at concluded that campus recruiting has to be reinforced and that employment galas have to be held as soon as 12 months in six metropolises, particularly Delhi, Mumbai, Kolkata, Chennai, Hyderabad, and Bangalore. Collaboration among Indian establishments and universities in foreign places has to be endorsed, so one can enforce first-class practices for instructing renewable power capabilities.

Upadhyay & Pahuja, (2010) attempted in this study to portray women as the key to sustainable development. Economic, environmental, and social pillars of sustainable development were used to frame the topic of gender equality. The study's findings revealed that expanding economic possibilities for women is critical to growth. Women-centered approaches to development aid and poverty reduction would result in quicker economic growth than gender-neutral alternatives. If women held more productive and decision-making positions, we might move more quickly and confidently toward economic, social, and environmental sustainability. Sustainable development was a political idea since it required sound governance, which will be difficult to attain until gender parity is achieved. Gender-sensitive development aid has the potential to be a significant force in allowing women to compete in land, labour, and product markets, so enabling them to contribute to economic, social, and environmental sustainability. According to the author, women are being left out of the green economy as a result of gender-segregated job patterns and discrimination. Schemes to attract women for atypical employment, train them in green work skills, and assure equal pay and labour norms should be launched.

Tu, (2020) examined eight developing nations' progress toward a green economy. China had renewable energy, Kenya had feed-in tariffs, Uganda had organic agriculture, Brazil had sustainable urban planning, India had rural ecological infrastructure, Nepal had forest management, Ecuador had ecosystem services, and Tunisia had solar energy. This research analyzed secondary data. According to this report, China's policy-driven expansion in renewable energy has resulted in the creation of employment, income, and revenue streams for emerging low carbon sectors. Uganda has made significant strides toward converting conventional agricultural production to an organic farming system through revenue and income generation for smallholder farmers. Kenya exemplifies how a forward-thinking energy strategy may contribute to matrix diversity, increased benefit streams for

small rural producers, and local development. Brazil has provided an example of how wise urban planning may help the country avoid substantial future expenses while increasing efficiency, productivity, and quality of life for its citizens.

Song and et.al., (2005) examined the possibilities for low-carbon employment in India. They attempted to quantify the potential for job creation in India as a result of the energy sector's transition to a low-carbon path, with a particular emphasis on the solar and wind energy sectors from 2010 to 2050. This analysis employed a straightforward analytical approach, utilizing the Government of India's policy aims and multiple estimates of employment creation per megawatt of added capacity. The research analyzed three possibilities for achieving policy objectives in each sector, each with its own set of assumptions, namely a scenario of strong growth, a scenario of moderate growth, and a scenario of low growth. The computed estimates for each scenario indicated a sizable opportunity for low-carbon employment, which was one of the primary co-benefits of developing the renewable energy (RE) industry. In general, solar energy technologies required more labour than wind energy technologies. India also has enormous potential for biomass gasification due to its extensive use of agricultural waste. This study concluded that government policies and programs were critical drivers of RE technology promotion, especially due to energy security concerns, and therefore that the proposed policies and programs should be rigidly enforced. Training and educational programs would be critical in preparing the economy for a larger emphasis on wind energy, as wind energy occupations are both highly skilled and semi-skilled.

Research Aim and Objective

- To identify similarities and differences among existing views and to propose potential hydrogen visions for India's future energy systems and investigate the consequences of roadmaps for actors, potential responses, and policy solutions for overcoming roadblocks and achieving the intended outcome.
- To gain a better understanding of the ambitions and roadmaps for advancing the hydrogen economy in India for clean and green growth

Research Methodology

Research approach is a systematic and logical method for unraveling the research problem. It might be comprehended with reference to how the research was finished logically. As research is a systematic investigation for acquiring significant data, the accomplishment of a research is incredibly reliant on its procedure. The outlining and sticking to the suitable approach all through enhance the nature of a research. This part manages the methodological proceedings of the present examination. The points of interest of research design and the different advances that are received in concentrate the research problem alongside the rationale behind them are portrayed.

To predict future possibilities, the "scenario approach" is employed in strategic planning and future research planning. Following the idea generating phase of this approach, comes the scenario analysis phase, which analyses the many potential prospects inside a scenario.

Research Design

The first type of quantitative research is descriptive research, which aims to collect measurable information in order to conduct statistical analysis on a sample of the general population. It is a widely used market research instrument that allows us to gather and define the characteristics of a demographic category. Descriptive research design has been applied by researcher to address research objective in this study.

Data Collection

Through the use of primary data, first-hand observations of the constructs have been obtained. On the other hand, secondary data have been utilised for the foundation of the study, the identification of a research gap, the identification of important constructs, and the development of a conceptual framework. The main data came through the use of a questionnaire, while the secondary data came from the collection of information from sources such as published papers and publications.

Data Analysis

In the case of hydrogen in India, some study has been conducted, and a prospective comparison approach based on PESTLE aspects has been used. The comparison of vision is a new spin on an old concept that has been around for a while. The outcomes of back casting tests typically result in the production of pathways. The backcasting method is taken to a whole new level by this research, which incorporates roadmaps that place acts in the context of time. It is possible to identify bottlenecks and drivers with the help of the roadmaps.

Findings and Discussion

The appropriateness of hydrogen with safflower biodiesel has been investigated, with the result that 100 percent safflower biodiesel with an addition of 8lpm hydrogen provides superior performance and reduced emissions. Green career chances have risen in prominence in recent years as a means of addressing both global climate change and persistent unemployment. To address the complicated dual problem of lowering unemployment and mitigating environmental degradation, economic growth is required while also redirecting economic development toward more environmentally friendly alternatives. Green economies will stimulate growth; they will create job and income possibilities while having a negligible negative impact on the environment. The research makes an enormous contribution through growing a unique hydrogen cycle version this is supplied as 4 corners of a rectangular-formed included complete so one can spotlight the interconnectedness and interdependence of numerous hydrogen lifecycle levels and related subsystems. Hydrogen Square (HydS) is a 4-stage (rectangular nook) device that consists of production, storage, safety, and use, in addition to purification and compression as subsystems. These subsystems can also additionally live

in single or extra corners of the HydS and ought to be blanketed into any pathway choice preference as an extra cost. The first nook of the HydS version changed into mentioned with regards to the opposite corners and the purification subsystem on this assessment observe. The end reached changed into that the hydrogen generating nook dictates the cleanness of the power contained withinside the hydrogen generated. However, the opposite HydS corners can also additionally make contributions to pollutants during the hydrogen's round-journey cycle. The literature assessment observed that HPPs have been labeled in step with the method kind withinside the mix, in addition to the sort of enter power and catalyst. The gift categorization version does now no longer offer a clean difference among the styles of enter power introduced to the numerous hydrogen-containing substances and catalysts hired with inside the method. It is extra of a method description than a paradigm for categorizing pathways.

Conclusion

The hydrogen financial system in Romania probably gives the opportunity to supply some of the benefits: sustainable improvement, valorization of neighborhood sources and financial competitiveness. However, giant demanding situations exist and those are not likely to be conquered without the extreme extra attempts of each significant government and industry. This is beneficial due to the fact there's no unique application for financing hydrogen technology studies, improvement and implementation. Until at this second the primary economic assist become confident with the aid of using the countrywide authority for scientifically studies, different ministers like the financial system, shipping and improvement, do now no longer finance studies and improvement projects.

References

- 1) Ball, M., & Wietschel, M. (2009). The future of hydrogen—opportunities and challenges. *International journal of hydrogen energy*, 34(2), 615-627.
- 2) Parikh, J. & Upadhyay, D.K. (2012). Renewable energy for gender empowerment. *Akshay Urja*, 5 (4), 20–22.
- 3) Reith J H, Wijffels R H, Barten H 2003, 'Biomethane and biohydrogen— status and perspective of biological methane and hydrogen production' Dutch Bio-Hydrogen Foundation, Rotterdam, pp. 118–125.
- 4) Stevens, C. (2010). Are women the key to sustainable development? Retrieved from <http://www.bu.edu/pardee/files/2010/04/UNsdkp003fsingle.pdf> (Accessed on 2013, May 8)
- 5) Upadhyay, H. & Pahuja, N. (2010). Low carbon employment potential in India: A climate of opportunities. Retrieved from http://www.teriin.org/events/pdf/technology_and_low_carbon_development/Low_carbon_India.pdf (Accessed on 2013, June 9)

- 6) Tu, K. J. (2020). Prospects of a hydrogen economy with Chinese characteristics. *Études de l'Ifri*, 62.
- 7) Song, L., Liu, M., Wu, W., Zhang, Q., & Mo, Y. (2005). Origins of rotational barriers in hydrogen peroxide and hydrazine. *Journal of Chemical Theory and Computation*, 1(3), 394-402.