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Royal commission at Yanbu environmental regulations

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Abstract

The purpose of this paper is to emphasis on Royal Commission efforts in protecting, controlling and monitoring the environment by implementing the environmental regulation and standards that rules all related potential pollutants and indicates industries investment towards using best available techniques (BAT) to have green economy and sustainable city. Royal Commission invested billions to build “Yanbu industrial City” through a strategic 30 year master plan. The Royal Commission for Jubail & Yanbu is responsible for conducting pollution associated with the development and operation of industrial cities. The Royal Commission had developed and adopted regulation, standards and guidelines to control substances emitted, discharged or deposited and noise generated within the industrial cities. RC Regulation and standards covered but not limited to the following sections: Environmental Regulatory System (that includes all regulation for all different pollutants in the city), Penalties system (to be applied for the violators and non-compliance industries), Air Environment (air quality index - metrological and air quality data – air quality stations), Water Environment (sampling and controlling the quality and others parameters in all types of water), Hazardous Materials Management (handling, recycling, treatment and disposal of hazardous waste), Dredging (caring and monitoring marine environment), Noise (occupational health), and Reporting & Record Keeping (data base).

In conclusion, Paper content will emphasize the application and implementing of royal commission environmental regulation specially that support clean and renewable energy and encouraging industries to apply the 3R principles and also trough the awareness programs that will be provided for the students and public to achieve the sustainable strategic goal, also will introduce the best available practice and technology in Yanbu industrial City in different process and operations.

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1. Introduction

The Royal Commission (RC) established as an independent governmental body in 1975 through a Royal Decree with the following Vision Statement and Environment Policy: “To be leading regional environmental center with state

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of the art technology and world standards by implementing the latest environmental management systems”

“The Royal Commission will continuously strive to improve the environment in MYAS, and will use all necessary technical and legislative tools including standards, regulations, permits, penalties etc. in order to protect the source and ambient environment from industrial and natural pollution and to ensure that the inhabitants live in a safe healthy environment”

Major objective of the Royal Commission has been industrialization coupled with environmental protection. Since inception, the Royal Commission has been determined that Jubail and Yanbu would be models of environmental planning and management in addition to being productive manufacturing centers.

The real benefit of industrialization can be appreciated by society only if the environment and public health are protected.

In this regard, it is to be emphasized that there must be a close cooperation between industries and environmental management personnel in order to achieve this goal.

The Royal Commission has formulated unified “Royal Commission Environmental Regulations (RCER)” to be adopted by industries in Jubail and Yanbu to provide a safe and clean environment for the residents. Any facility operating or proposing to operate on Royal Commission property will be required to comply with these regulations.

However, in this paper the author focused on the compliance with environmental regulations is essential in protecting public health and the environment. While voluntary compliance is desirable, the Environmental Penalty Scheme has been designed to supplement such compliance and ensure compliance with regulations to further assist in accomplishing the goals of the Royal Commission by deterring violations and encouraging voluntary compliance with the Environmental Regulations.

The Royal Commission recognizes that both environmental regulations and enforcement mechanism are necessary to provide an effective regulatory system to protect the environment from any of the adverse impacts which might be anticipated from the industrial activities and in turn to protect the public health at large.

2. Royal commission environmental regulations and programs

Industrialization with environmental protection is a major objective of the Royal Commission whereby all the communities, public bodies and private sector organizations in Jubail Industrial City and Yanbu Industrial City, join in a common effort to maintain the quality of the environment. The Royal Commission Environmental Regulations provide a framework to ensure this objective is achieved.

To ensure that the two Cities developed to exploit the hydrocarbon resources of the Kingdom sustain the development process without adversely impacting the environment, the RC applies several measures right from the planning stage. These measures and policies are implemented through the following comprehensive program

2.1 Air quality program

The main objectives of ambient/source air quality program, which is considered as one of the most important programs implemented at Environmental Control Department, are: (1) to determine whether the air quality level at Yanbu industrial city is being adversely affected by the industries or any other activities; (2) to assess any increase in pollutant levels and indicate the cause by using air quality stations, reporting, AQI and other methods.

2.2 Water quality program

The purpose of this program is to monitor and control the quality of different types of water such as industrial waste water, irrigation water, ballast water, drinking water, sanitary waste water and storm water. Royal commission laboratory is equipped with the latest tech and high quality equipment to perform quick and accurate analysis of water samples, solid, physical test, chemical test of metal ions and hydrocarbon, pesticides, oil, grease, organic inorganic and many others different test. Daily and periodically report will be prepared by qualified lab staff for analysis, action and result investigations.

2.3 Waste management program

This program describes the technical supervision of actions & undertakings concerning the management of hazardous and non-hazardous industrial wastes generated within the Yanbu Industrial City. Hazardous solid waste is collected by an RC authorized agency and treated to RC established standards. Domestic and industrial wastes are collected and treated at RC owned and operated centralized facilities. Industries are required to meet standards for
discharging into such facilities.

The treated industrial and domestic waste water are available for specified and regulated use such as firefighting, landscaping and industrial use. It includes routine activities such as inspection & audit, review & evaluation of the submitted reports from the generators, issuance of manifest and so on to ensure that all industrial facilities (waste generators, transporters and waste management facilities) within RC jurisdiction are in compliance with royal commission environmental regulations and other internationally accepted best practices and guidelines.

2.4 Penalty program

The Royal Commission penalty system is designed to assess and recover fines resulting from non-compliance with the environmental regulations for the respective industrial cities. The objective of the penalty system is to enforce compliance with RCER. As such, all industries are encouraged to develop and implement compliance plans and, where non-compliant, commit to a schedule of corrective measures to achieve compliance.

The penalty scheme describes the general principles for determining the penalties that the Royal Commission deems appropriate to deter violations of specific environmental regulations and encourage facility compliance. It is based primarily on following considerations:

- The nature of violation;
- The magnitude and duration of violations by the industry;
- The economic benefit gained by the violator.
- The economic advantage over others who incurred costs for compliance.
- The prior compliance history of the facility

2.5 Land use planning program

Based on assessed impacts, areas were zoned and selected for location of community, industry, recreation and other usage – adequate separation distances and buffer zones have been established, as well as, safe routes for transportation in normal and emergency situation. The impact of industrial activities on the ambient air, water, soil and health of the population is assessed at all stages of development. During planning and selection of sites for industrial parks, communities, utilities production and supply.

3. Sustainability development in Royal Commission

Sustainability is the spirit of the modern approach for alerting people of a problem before it’s happened, and direct policy makers to which way to go for the best solution Charles, et al, [1]. From the literature review, as the definitions of sustainability are various, this is defined according to the frame of reference. However, in this paper the author highlighted on sustainability for a city which is designed for the petroleum industry. It required common developing pillars at any society; these are economy, community, as well as resources. More factors are developed with the relapse of time and added to the three pillars which shaped the current practice of sustainability development at the RC. Moreover, the Environment Protection and Control Department (EPCD) at the RC have contributed to the all of these pillars through policy and regulation to conserve past and future achievement. The sustainability concept at RC became the first priority, which is involved in every project at the city.

The RC is responsible to implement the concept of sustainability from the start to the construction until operation [2]. According to the EPA Sustainability: “to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations” [3]. The UN definition of sustainability development is “meets the needs of the present, while improving the ability of future generations to meet their own needs” [4]. RC accommodates various views of global institutes and organizations such as EPA and UNDP into the Environment Regulation (RC-ER).

However, national considerations for status of the basic support system are taken into account which gives clear vision on sustainability as well as indicator for Saudi Arabia. Brown et al, said that “A clearer understanding of global sustainability and the development of appropriate indicators of the status of basic support systems would provide a useful framework for policy making”[5]. Moreover, indicators require a demonstration of value to the organization, Meadows said that “Indicators arise from values (we measure what we care about), and they create values (we care
about what we measure)” [6].

4. Royal commission vision and mission toward sustainability development

The Vision of the Royal Commission is to be the best choice for investors in petrochemical and energy-intensive industries and the leading contributor to the Kingdom’s growth. The Mission of the Royal Commission is to: “sustainability in planning, promoting, developing and managing Petrochemical and Energy-intensive industrial cities through successful customer focus and partnerships with investors, employees, communities and other stakeholders” [7].

4.1 RC sustainability development objectives are:

- Developing best-in-class industrial cities and attractive urban communities.
- Providing top quality, responsive services to the tenants and the community, at the most optimal cost.
- Ensuring availability of top education, healthcare, social and security services, and enforcing world-class environmental and safety.
- Ensuring availability of top city infrastructure and services.
- Achieving financial sustainability, and developing private sector participation.
- Attracting, developing and retaining qualified employees at all levels.

4.2 Designing with the concept of sustainability development

Yanbu Industrial City is a modern manufacturing and residential community located on Saudi Arabia's Red Sea coast 350 kilometres. Built from scratch in less than two decades, two long pipelines were built to connect east and west coasts of Saudi Arabia, ensuring steady supplies of oil and gas in Yanbu to be transformed into refined products and feedstock for petrochemical industries, as an outgrowth of the country’s drive toward industrial diversification.

Yanbu is now the largest crude oil export terminal on the Red Sea and a leading manufacturing centre for petroleum products, petrochemicals, and consumer items. 26 major plants in (RC) industrial park are helping satisfy local and world demand for refinery products, petrochemicals, and other commodities. Approximately 90 manufacturing and 60 support industries are also in operation, while several more plants are being designed or constructed. Royal Commission capital is $221 billion – the highest for any city in the country. Annual economic growth rate is 18% and investment growth is 5.8%.

4.3 Desirable, traditional and contemporary indicators

The main goal of sustainability must be in general, flexibility, relevance and adaptability to the needs of countries according to capacities and priorities. The result of other studies showed that the traditional sustainability focuses on environmental development economic development social development.

Additionally, the RC added more indicators to measure its performance with a comprehensive set of indicators that could tackle many aspects for improving the quality of life. It originated between the strategic planning department and other pertinent department. Furthermore, the RC in general emphasises on quality of living standards at all levels. Therefore, the following indicators serve the city according to the strategic vision for quality of life. The indicators are as follow: economy and finance, housing, education, energy, environmental best practise, strategic planning, health, telecommunication, urban planning, waste (water, solid), and sanitation.

4.4 Sustainability indicators at the RC

The RC is the Saudi vanguard for developing the petrochemical and refinery industry. Local and international experience added their contribution determining the best practices of sustainability development. RC tested their sustainable development indicators through many judgements teams locally and internationally. Recently, RC won
many awards under the UN program of sustainability development such as UN LivCom award in 2013 as well as UNEP Sasakawa Prize. The RC achieved recognition as the third city in the world for sustainable communities. Additionally, the RC won the prize for first city in environment management “2014 Kingdom’s International Award for Environmental Management”.

The following section demonstrates the detail of different categories that shape and drive the sustainability development at the RC, and it contains a comprehensive set of indicators. Internally, the comprehensive set of indicators designed as a questionnaire and answers dialogue that present the progress of the performance of the RC. Moreover, the following categories are the outcome of the process of selecting sustainability indicators. Each category consists of a list of indicators to be reported in standardized format according to Sustainability Reporting Guidelines (SRG). The categories and the indicators as follow:

4.4.1 Industrial and economy growth
This table shows the rapid growth in different types of industries either big refineries, petrochemical or mineral and the attraction of clean and add values industries to the city which is one of the most important indicator for the sustainability

Table 1. Industrial and Economy growth indicators

| Number of industrial rate | Diversifying investment | City unemployment rate |
|--------------------------|-------------------------|------------------------|
| Material supply          | Innovation              | Employee turnover Rate |

4.4.2 Financial support
This table indicates the financial income and incoming rates to the organization that will support the city economy an future financial plans.

Table 2. Financial support indicators

| Own-source revenue | Income rate |
|-------------------|-------------|
| Financial stress  | Tax rate    |

4.4.3 Energy efficiency
This items related to the energy efficiency programs, project and achievements as per the global and local regulations to safe burning fuel and using clean and renewable energy sources.

Table 3. Energy efficiency

| Energy supply          | Energy efficiency policy |
|------------------------|--------------------------|
| Electrical energy use  | Energy consumption of public |
| Electrical interruptions| Renewable energy supply  |

4.4.4 Environment best practise
Different environmental projects that directly related to reduce environmental emission or discharges done by the city or the industries in different environmental fields comparing with best environmental practice globally.

Table 4. Environment best practice

| Air quality          | Marine             | Disaster preparedness and response | Mangrove         |
|----------------------|--------------------|-----------------------------------|------------------|
| Water quality        | Greenhouse gas emissions | Monitoring discharge             | Hazard waste control |
| Lab machine and dives availability | Particulate matter measurement | Study and research             | Climate change    |
| Renewable Energy     | Lab services        | Awareness program                 | Inspection       |
| Penalty              | Sustainability report | Environment impact assessment     | Industrial waste Recycling |
|                      |                     |                                   |                  |
5. Concluding Remark

It is indeed a great pleasure to see that industries in Jubail and Yanbu have been showing much commitment for the environment and have always cooperated closely with the Royal Commission. It is expected that such cooperation between industries and RC will continue in future. Moreover awareness programs and participating in the international and national events and conferences create an ideal image to the royal commission that load more responsibility towards environment economy and community.

Awareness and high priority to protect and monitor the environment to continue for 3R principle clean and renewable energy to have a sustainable resources health and safe environment. We are also closely working with companies that face difficulty in fulfilling with the new and updates environmental regulations through technical meeting specially when the project is costly to comply with these regulation so due to close cooperation and coordination between the royal commission and industries, we can conclude the best solutions that will end by protection the environment and will to effect the company process or product quality.

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