

Project title:

**Compilation a Strategic Document and Roadmap for Nationalization and
Developing Membrane Processes in Sustainable Water and Energy Production in
Iran**

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Contractor : NRI	Project Code : PPCPN26
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Abstract:

Humans interact with their environment; it means continuation of human life requires benefit from environmental resources and the style and manner of human life affects the environment. This interaction can be constructive or destructive. Sustainable economic development is a fundamental step towards the optimal construction and use of nature. Sustainable development means using the right factors in nature to create a renewable cycle to reproduce fuel, tools, etc.

Membrane processes due to the simplicity and efficiency, selectivity and selective transfer of desired components, adaptability and proper application in integrated processes, low energy consumption, appropriate sustainability under various operating conditions, environmental compatibility, appropriate control and the ability to scale up easily has always been considered as an attractive option in various industrial processes. One of the main advantages of membrane processes is their low energy consumption due to the lack of a transition phase in the separation processes. Also due to the ability of using recirculation flows and recycling some materials in the output stream, it can reduce waste and waste in various industries. Membranes and membrane processes, according to the mentioned advantages, are considered by research centers, manufacturing companies and consumer industries such as chemical production units, oil and gas refineries, petrochemical units, water and power generation plants, food industries. medicine, drinking water suppliers, and etc. In our country, on the one hand, a significant number of research centers focus on the construction and development of membrane applications, and on the other hand, the use of membranes for desalination and water treatment in many industries has been considered. In addition, the use of membranes in the food, pharmaceutical and other industries is growing significantly.

In today's changing world, the development of technology as a competitive element, and the engine of economic growth, is becoming increasingly important. Different countries, depending on their situation and circumstances, to achieve higher growth and better economic status, consider policies to develop their technology, especially with a focus on strategic technologies; and governments by developing national documents for these technologies, they are intervening purposefully in the development of technology and industrialization. For this reason, in order to have a focused and cross-sectoral policy, it is necessary to direct and coordinate technology development

activities and optimal allocation of resources. Compilation of a strategic roadmap is the main key in order to develop the application of membrane processes in water and sustainable energy supply in the country. Therefore, the present project studies the future of this technology and evaluates the existing capabilities for its localization in the country. Among the outstanding results of this project are the development of a roadmap (roadmap) and an operational plan for the localization, use and development of membrane technology in sustainable water and energy supply.

Project results:

- 1- Explaining the dimensions, identifying technological areas and evaluating the application of membrane processes in water and sustainable energy supply
 - a. Investigate the fabrication and synthesis of various organic and inorganic membranes and attempts to localize them
 - b. Investigate the processes of water and wastewater treatment with membrane technology
 - c. Investigate the processes of water sweetening with membrane technology
 - d. Investigating the processes of using polymer membranes in Lithium batteries and fuel cells
 - e. To study the processes of purifying biofuels and biofuel refineries with membrane technology
 - f. Examination of gas separation processes with membrane technology
 - g. Investigating the construction and synthesis of membrane reactors and bioreactors and efforts to localize and domesticize them
- 2- Developing the vision of membrane technology in water and sustainable energy supply
- 3- Development of roadmap and operational plan in order to localize, application and development of membrane technology in water and sustainable energy supply

Project Documents:

PPCPN26\E: Compilation a Strategic Document and Roadmap for Nationalization and Developing Membrane Processes in Sustainable Water and Energy Production in Iran, January 2020.