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Project Title: Develop a business plan for mass production of Evaporative cooler high-efficient motors.

Department:	Knowledge transfer , production and the use of permanent magnet electric motor (PM)	Employer:	Niro Research Institute
Project/Program Manager:	Hassan Ebrahimirad	Executor:	Sohrab Amini-Valashani
Project Financial Code:	127135	Project Quality Code:	PETPN08-1
Type of Project/Program:	(Font:Times New Roman 10)	Assistant:	Technology

Project Staff: Sohrab Amini-Valashani

Project Necessity:

Evaporative coolers are one of the bulky appliances used during peak power consumption in Iran. Almost 50 years ago, when this product was produced in the country, there was no innovation in the production process of this product. According to studies, the number of water coolers in the country in 1397 is about 18 million and according to forecasts made in 1410, this number is estimated at about 30 million devices (only in the home sector). Also, according to studies, evaporative coolers currently impose a requirement of 10,000 MW on the network during peak hours, which by using new technologies and reducing the average power consumption can have a significant effect on reducing peak consumption. In this project, various methods of implementing the plan to upgrade the engine of water coolers have been studied and various strategies have been studied and evaluated by collecting the opinions of stakeholders

Project Goals:

- Obtaining the opinions of manufacturing companies for mass production of high-efficiency evaporative cooler motors
- Explore the challenges of developing high-efficient motors
- Economic calculations of high-efficient motors replacement
- Develop a business plan for mass production of Evaporative cooler high-efficient motors

Abstract:

In this research, in the first step, the opinions of manufacturers in the field of motors and evaporative coolers have been collected and reviewed, and suggestions, challenges and opportunities have been reviewed. For this purpose, we corresponded with about thirty manufacturers, some of whom offered suggestions for mass production of high-efficient motors. A summary of the proposals is given in Table 1.

Table 1: Summary of proposals of companies producing evaporative cooler

	company name	Reduction of import tariffs	Strict monitoring supervision	Elimination of by-products	High-efficiency electric pump	Upgrading the authorized category	Modification of the standard	Allocation of loans	Allocation of subsidies to evaporative	Allocation of subsidies to motor manufacturers	Allocation of subsidies to the consumer	Advertising	Support for export	Requirement of government procurement
۱	Electrogen		✓	✓	✓	✓	✓				✓	✓		
۲	Kia Electromotorpart											✓		
۳	Motogen						✓	✓	✓		✓	✓		✓
۴	Absal	✓		✓			✓		✓	✓	✓			
۵	energy								✓	✓	✓	✓		
۶	Jahan kar Mashhad							✓						
۷	General Pouya										✓	✓		
۸	Sepehr Electric									✓				
۹	Kaveh kavir	✓			✓	✓	✓				✓	✓		
۱۰	Lorch			✓	✓	✓	✓			✓		✓		
۱۱	Garmaye Jonob							✓		✓				
۱۲	Mashhad Dvam	✓		✓		✓	✓	✓	✓	✓		✓		
۱۳	Arj													
۱۴	Sangar kar								✓			✓		
۱۵	Pars Home Appliances							✓						
Total		3	1	4	3	4	6	5	5	6	6	9	1	1

In the next step, the role of consumer optimization in the world was studied. As can be seen in Figure 1, the behavior of countries around the world towards optimization has also been studied.

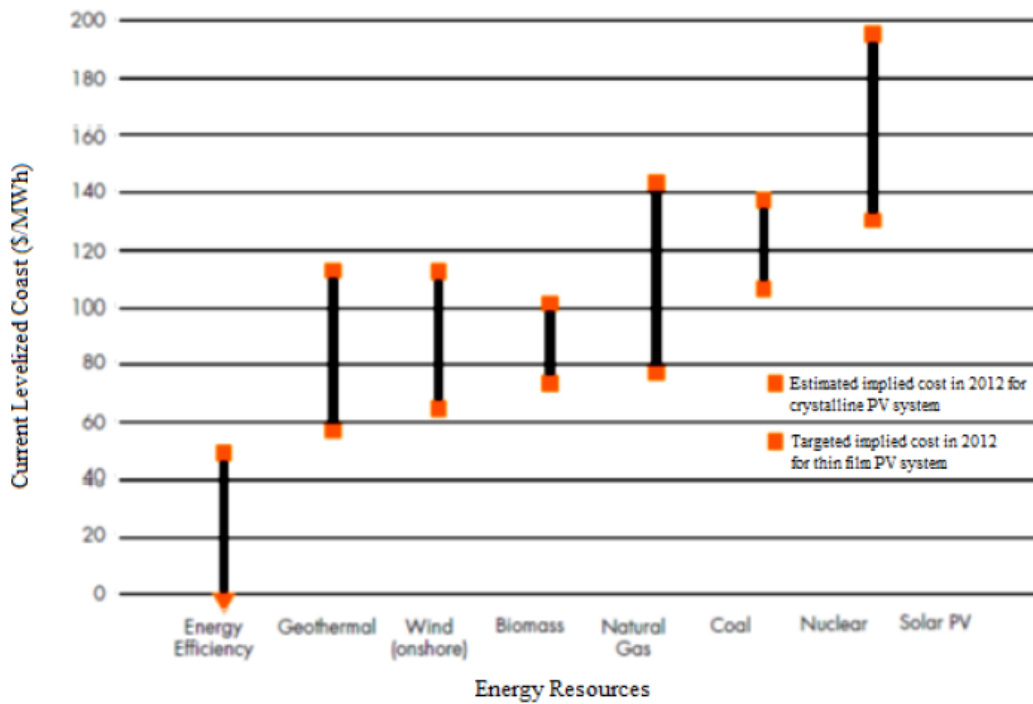


Figure 1: The cost of creating new energy sources

The economic analysis including the amount of savings as well as the amount of investment required for the project based on the following calculations is presented in Table (1). This analysis has been done taking into account the hypotheses given in the previous section.

Table 2: Economic analysis of replacing one million high-efficient evaporative cooler motors and the average savings per cooler 153 watts

Row	plan	Energy demand savings (MW)	Energy savings (GWh)	Reduction of air pollution (Thousand tons)
1	replacing one million high-efficient evaporative cooler motors	246	380	253

Main Results (technical outputs, patents, papers, books, reports, etc.):

- Report "Development of Business Plan for High-Efficiency Water Cooler Motors", Advanced Electric Motor Research Center, Niroo Research Institute
- Hassan Ebrahimirad, Sohrab Amini Valashani, Technical and Economic Evaluation of Replacement of Conventional Evaporative Cooler motors with Permanent Magnetic Electric Motors, First International Conference on Electric Motors and Generators, ICEMG 2020-Sabzevar-2020.