The necessity of having a system thinking for the development of fully electric transportation

Is it possible to develop the use of electric vehicles without paying attention to infrastructure?

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These days, the story of electrification of the automotive industry, or rather the assembly of electric vehicles, electric taxis, and electric buses, has become a hot and widespread movement, and officials from the Ministry of Transportation, Municipality, and others are talking about their short-term and long-term plans for electrification of transportation. Although in 2024, the approach towards electric vehicles is no longer a choice, but a necessity, for this issue, a systemic perspective or holistic thinking must be taken. Otherwise, the story of electrification of the country's automotive industry will be like the story of the country's gas distribution network. In Europe, the use of natural gas for energy to heat people's homes began in the late 19th century, and after World War II, this issue accelerated. However, by the middle of the 20th century, European countries gradually realized the disadvantages of this extensive gas distribution network, which far outweighed its benefits. Thus, even countries that had access to cheap natural gas resources decided to use this gas to produce cheap electricity in the late 1970s, and as a result, cheap electricity was used to provide the energy needed to heat

homes. However, in Iran, regardless of the experiences of others, the movement to expand gas distribution to homes and cities was created only in the early 1970s, that is, the early 1990s. Today, this extensive gas distribution network has put the country in a situation where the world's second largest gas holder is facing a gas shortage in the network or gas imbalance. Because energy waste in the gas consumption network is more than sixty percent, and if this gas were used to produce cheap electricity, we would not be facing the problem of gas shortage today, and we are surprised how the second largest gas holder in the world has ended up in this situation without a strategy and proper management of its resources. With this relatively long introduction, which was intended to raise awareness of the importance of the issue, we will move on to this article;

While the country's officials are showing their attention and focus on the production and expansion of electric vehicles by launching many exhibitions, programs, and unveilings this year, with the paradigm shift in the global automotive industry, the main issue is no longer the transition from the production of gasoline and diesel vehicles to the production of electric vehicles or hybrid vehicles. Rather, the main issue is the source of electricity for these vehicles. We all know that, unlike hybrid vehicles, fully electric vehicles obtain all their energy needs from urban fast charging stations or home charging stations, both of which are connected to urban electricity. However, the main question and issue today in the automotive industry is whether the source of this electricity is renewable resources or non-renewable resources, or fossil fuels?

Renewable sources of electricity generation are wind power plants or wind turbines, solar power plants or solar cells, and of course hydroelectric power plants or dams. Some countries also have nuclear power plants or geothermal power plants, but in contrast to fossil fuel power plants or non-

renewable sources, there are power plants that use furnace oil or mazut, natural gas or coal as an energy source. Today, most developed countries in the world have declared the period between 2025 and 2035 as the final limit for the production of vehicles with internal combustion engines. In fact, all developed countries in the world will stop producing internal combustion vehicles by 2035, but it should be noted that the source of electricity supply in these countries is generally renewable sources. European countries generally generate their electricity from wind, solar, or hydropower plants, and many of them, including Germany, have shut down their nuclear power plants in the past few years and ended their activities. In some other countries, such as France, nuclear power plants are still in operation, but in these countries, the main share of electricity production is from renewable sources, which have the least destructive effects on the environment. In fact, perhaps among the developed countries that have declared 2035 as the year of the end of internal combustion engine vehicle production, only China still supplies a large part of its electricity from coal-fired power plants. However, China is also converting its electricity sources from coal and other fossil fuels to wind, solar cells, and other renewable fuel power plants in parallel with the development of the electric vehicle industry. In fact, the development of the electric vehicle industry in China is parallel to the change in the The paradigm shift in the country’s electricity industry from fossil fuels to renewable energies is underway. If the development of the use of electric vehicles is carried out without considering the source of electricity generation for them, according to most scientific studies and research conducted in recent years, it will not only not reduce air pollution, but in the long run will increase more destructive effects on the environment because the only source of air pollution, namely the exhaust of millions of cars in the city, will be replaced by the huge chimneys of several hundred fossil fuel power plants that will continuously introduce heavy and concentrated volumes of polluting gases into one

point of the ozone layer. For this reason, it is necessary to pay attention to the need to change the infrastructure of the country’s electricity industry, as in China, in addition to paying attention to the production of electric vehicles. Currently, unfortunately, more than ninety percent of the country’s electricity consumption is generated by coal-fired power plants.