

Modeling the goals of the west from the nuclear dispute with Iran using system dynamics

Hamdollah Cheraghi, Heirsh Soltanpanah*, Mansour Irandoust

Department of Management, Sanandaj Branch, Islamic Azad University, Sanandaj, Iran

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Abstract

In this research, the system dynamics method has been used to simulate the causal loop model of the goals of the West from the nuclear dispute with Iran. First, we deal with the crises in which the Western world, the US at its head (especially the US), is involved. In the following, the status of sanctions policy and economic sanctions are discussed as the pressure lever in contrast to political issues and international conflicts. Given the existence of the Iran-West nuclear dispute, and the US at its head (mainly the US), the effects of the sanctions are expressed below and the relationship between the goals of the West and the nuclear dispute with Iran is shown by developing a comprehensive model. In the model, the goals of the West from the nuclear dispute with Iran, including the transition of the West from fossil fuels to new energy, the US trade deficit by raising the price of oil, the systemic leap of the West, the survival of the military industry of the West, and the project of the passageway of Western civilization using causal loops are modeled. The developed models provide a comprehensive and systematic perspective for policymakers.

Keywords: Iran Nuclear Dispute, Goals of the West, Sanctions, System Dynamics, Systemic (Systems) Thinking, Simulation

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1 Introduction

Among the quadruple (four) shocks and crises that threatened the political system of the West in the twentieth century, the West was only able to manage three of them (devastating all-out wars, economic crises, and the expansion of communist regimes) and reduce the possibility of their recurrence - of course, with our current outlook and information - to almost zero. But ironically, as we get closer to the end of the twentieth century, and as the early years of the twenty-first-century pass, developments have progressed in a way that has exacerbated the occurrence possibility of the devastating energy crisis for the West. So the West entered the 21st century while bringing a sinister legacy (for the Westerners) into the 21st century, which was the heavy dependence on oil and its inability to fully manage the developments in the field. And, of course, a wise West is expected to think of a fundamental solution before arriving at the crisis. At the beginning of the third millennium, Americans base their strategy on balancing two goals: "The first goal is to enjoy the interests (benefits) of a cohesive world." "The second goal is that US strategy should be to

*Corresponding author

Email addresses: h.cheraghi28@gmail.com (Hamdollah Cheraghi), heresh@iausdj.ac.ir (Heirsh Soltanpanah), nwmi2005@gmail.com (Mansour Irandoust)

control the global destabilizing forces in order to stabilize the aforementioned interests¹ [19].” It is clear that the first goal will be achieved by accelerating the process of globalization, and the second goal will be achieved by downplaying (trivializing) the forces of instability. The economy’s dependence of the West on oil is clearly one of the main causes of instability, which its effect on global stability must be eliminated by downplaying it [30].

Energy as a geopolitical variable has (opened) a special place in the power games of the global system and access to energy resources has strategically become important for all hierarchy levels of the world power [17].

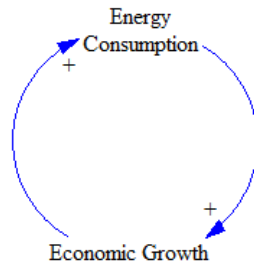


Figure 1: The Incremental Relation between Energy Consumption and Economic Growth

Table 1: Forecasting the Effect of Change in the Growth Rate of Oil Consumption on the Absolute Amount of Oil Demand [30].

Average annual growth rate of oil demand (percent)				
Amount of oil demand (million barrels per day)	Year/Growth Rate	0.8	1	1.5
	2020	93	100.5	104
	2030	95.7	105.5	120

The Middle East, especially the Persian Gulf region, is the source of approximately 60 percent of the earth’s oil reserves and about 40 percent of its natural gas reserves, thus conditions were prone to explosion for the energy-hungry world. A world that has deeply linked the industrialized and industrializing economies to issues such as conflict and regional status [4]. Consequently, if the Middle East is the focus of attention of the hegemony due to its energy resources, it must be accepted that Iran is at the center of this focus because of its strategic position in the energy transmission lines [38]. The most important areas of conflict and political security challenge between Iran and the US are: 1. Oil, 2. Strategic position, 3. Political Islam, 4. US-Israel special relations [32]. Over the past few years, Iran’s nuclear capability problem has overshadowed other concerns of the West about the Middle East, including the Israeli-Palestinian dispute. Stopping Iran from achieving the possibility of producing the hypothetical nuclear weapons has become the highest foreign policy priority not only for the US and Israel but for all Western powers [3]. The contemporary system of the Westphalian world (more commonly referred to as the world community) seeks to curb the chaotic nature of the world with a vast network of international organizational and legal structures, which provide free trade and a stable international financial system, establish the accepted principles for resolving the international disputes and impose the restrictions on the manner in which wars occur [18]. Historically, the United States has sought to use nuclear technology for commercial purposes to influence the nuclear security standards and non-proliferation of nuclear weapons. As the domestic nuclear industry stagnates and export industries decline, the United States will lose the important foreign policy tools and the power of influence in maintaining the political standards [20]. In the contemporary period, there has been a more serious emphasis on economic sanctions as an important foreign policy and a deadly weapon to replace costly military wars. In a scientific discussion, fundamental questions are raised about this powerful political tool, such as what motivates a country to impose economic sanctions or change the sanctions policies? What political and economic factors are involved in the success of sanctions policies in achieving the desired results? What are the costs of economic sanctions for the sanctioning country and the target country? What methods are used to analyze the impact of sanctions on the economy of countries? What approaches are needed to further reduce the impact of sanctions on the economy and solutions to overcoming today’s economic shocks? [8]. Since

¹US National Security Strategy for the 21st Century, pp. 271 and 315.

1990, the US share in the application of economic sanctions policy and the number of economic sanctions has sharply increased after the collapse of the Soviet Union and the end of the Cold War; such that the US share increased up to 92% in the total world economic sanctions during the period 1990-1999; so that US government, only in the first term of Clinton's presidency, imposed 61 economic sanctions on 35 countries with a population of 2.3 billion people, i.e. 42% of the world's population, and \$ 790 billion in exports, that is, 19% of global exports [2]. The apparent goals of these sanctions were: human rights violations: 22 cases, the fight against international terrorism: 14 cases, non-proliferation of nuclear weapons: 9 cases, protection of workers' rights: 6 cases, Environmental protection: 3 cases, and prevention from the expansion of disputes and civil wars: 7 cases. The important point is that the US has attempted to involve the international institutions or some European countries in most of its sanctions since the 1990s, in order to reduce the international reactions against itself, in addition to increasing the impact of sanctions [14]. During the 1980s and 1990s, there was a wide range of sanctions and trade restrictions on the Islamic Republic, targeting its regional power in the Middle East, but more recently, sanctions have focused more on the nuclear program of the country. Until the end of 2000, the United States maintained a higher level of intervention over Iran's nuclear program than European countries and other members of the United Nations. The turning point in this cooperation was from 2010 to 2012, with the aim of imposing new sanctions, trade restrictions and centralized sanctions on the nuclear program. International sanctions against Iran, which primarily target Iran's key energy sectors and its ability to access the international financial system, have harmed Iran's economic growth, especially between 2011 and 2014. Sanctions in this period have reduced Iran's GDP by more than 17%, which has been the largest decrease in 2012 (Figure 2) [11].

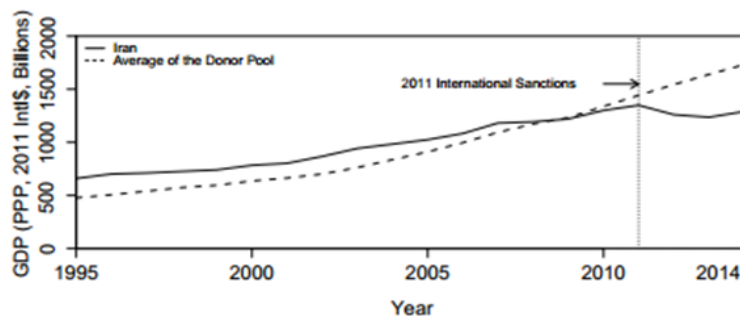


Figure 2: Graph of Iran's real GDP

Unilateral US sanctions before 2006, although widespread, are small (insignificant) compared to the new sanctions that they imposed on the Islamic Republic of Iran. From 2006 to 2013, about five laws and a number of executive orders were issued by Congress and the US government against Iran. They have also called for more pressure on the Islamic Republic of Iran by raising the case (issue) of the Islamic Republic in the Security Council and approving the various sanctions laws specific to Iran [37, 31].

Since 2006, the United Nations has imposed sanctions in various fields, including nuclear problems, trade, military, shipping, etc., through resolutions No. 1696-1737-1747-1803-1835-1929 [1, 36]. The domestic and foreign economic and political shocks cause exchange rate fluctuations, given the significance of the virtual variable in the short and long term, therefore, if the country has economic and political stability, it will stabilize the foreign exchange market and prevent the exchange rate fluctuations. Political and economic events at the regional and international levels affect the exchange rate. For example, if a war breaks out in a neighbouring oil-exporting country, the price of oil will fluctuate. These changes in the price of oil for a country like our country (Iran), which has an oil-dependent economy, will cause a recession or prosperity of the country, which will have a significant impact on the exchange rate [32]. The exchange rate is one of the key variables in any economic system and in countries such as Iran, the importance of exchange rate fluctuations is much higher, where the bulk of government revenues come from foreign exchange receipts from exports [10]. The exchange rate is one of the key variables in the economy that affects many other variables such as exports, imports, foreign investment, production, consumer behavior, deposits, etc. And it is affected by many other variables in the economic, political environment, and so on. On the other hand, the problem of the nuclear dispute between Iran and the West has led to the imposition of sanctions in various fields against Iran, which since 2003, many of them with direct and indirect impacts on different variables have caused some changes in exchange rate. According to the review of the online economy website, exchange rate fluctuations in the last thirty years are in accordance with Table 4. In the last thirty-two years, the Rial/Dollar exchange (conversion) rate has increased up to 260 times.

Given the time-consuming nature of the problem of the Iran-West nuclear dispute and its impact on important

Table 2: The most prominent US sanctions against Iran since 2005~2021

Title	Date	Sanctioning reference	Description of selected elements
Executive orders 12170,12205,12205	November 1979 to April 1980	Jimmy Carter	Seizure of assets and property and prohibition of trade in some items, including the import of all goods from Iran (in 1981 these restrictions were lifted).
Country supporting terrorism	Jan-84	-	Prohibition of arms sales and foreign aid to Iran
Reagan announcement	Sep-87	Reagan	Prohibition of selling diving equipment to Iran
Executive Order 12613	Oct-87	Reagan	Prohibition of import of all goods, especially oil from Iran
Iran-Iraq Non-Proliferation Weapons Act	Oct-92	George Bush	Transfer of goods or technology related to weapons of mass destruction and some conventional weapons to Iran was banned
Policy of dual containment of Iran-Iraq	Apr-94	George Bush	Intensification of arms and technology restrictions against Iran
Executive Order 12613	Nov-94	Bill Clinton	Exports of weapons of mass destruction were countered
Executive Decrees 12957 and 12959	March to May 1995	Bill Clinton	Prohibition of any US investment in Iran and prohibition of the transfer of goods from the United States to Iran
Iran-Libya Sanctions Act	Aug-96	Bill Clinton	Sanctions on companies that have invested more than \$ 20 million in Iran's oil sector.
Executive Order 13059	Aug-97	Bill Clinton	Extending the export ban to Iran
Law on Prohibition of Reproduction of Weapons of Mass Destruction in Iran	Mars 2000	Bill Clinton	Sanction all legal entities and individuals that supply Iran with goods related to weapons of mass destruction and ballistic missiles
Agricultural Credit Law	Oct-2000	-	Prohibition of US Government Export Guarantees
Executive Order 13224	Sep-01	George W. Bush (son)	Sanctioning the assets of international terrorist sponsors
Executive Order 13382	Jun-05	George W. Bush (son)	Seizure of assets and property of supporters and producers of weapons of mass destruction
Freedom Protection Law in Iran ²	Sep-06	George W. Bush (son)	Sanctions on investing countries in Iran that contribute to the development of nuclear weapons and mass destruction in the country, ban trade with the United States, prevent money laundering related to weapons of mass destruction
Executive Order 13438	Jul-07	George W. Bush (son)	Seizure of assets of individuals and legal entities that seek to destabilize Iraq
Comprehensive Sanctions Law ³ , Accountability and Non-Investment ⁴ , Executive Order 13553	July and September 2010	Congress and Obama	Sanctions on the sale of gasoline to Iran, sanctions on foreign financial institutions that support Iran's nuclear program, confiscation of assets of people who do not respect human rights.
National Defense Authorization Act ⁵ , Executive Orders 13572-13574-13590 - US Patriot Act - Section 1245 National Defense Authorization Act	March to December 2011	Congress and Obama	Seizure of property and assets of human rights violators in Syria (including Iranians) - Approval of amendments to sanctions on Iran ⁶ - Sanctions on financial support in the petrochemical sector and development of energy resources in Iran - Combating money laundering in the Iranian financial sector - Restriction Iran Oil Export - Compilation of Section 311 Money Laundering
Executive Decree 13599-13606-13608-13622-13628-Iran Threat Reduction Law and Russian Human Rights	February to October 2012	Congress and Obama	Freezing Iranian government assets in the US area - Freezing the assets of human rights violators through communication technology - Sanctions bypassing sanctions - Sanctions on foreign financial institutions that facilitate the sale of oil. Sanctions against supporting Iran's oil sector - Sanctions against violators Human Rights in Iran and Syria - Sanctions on companies affiliated with the Revolutionary Guards - Expansion of the Law on Reducing the Threat to Iran and Russian Human Rights
Law on National Defense Authorities - Law on Protection of Freedom to Combat Nuclear Weapons in Iran - Executive Order 13645	February to July 2013	Congress and Obama	Seizure of assets of persons who provide goods or services in the energy sector - shipbuilding and shipping - blocking the entry of oil revenues into the country - tanker insurance - sanctions on the import of gold - granite - coke - aluminum - sound sanctions and Iran TV - Sanctions on participation in Iran's automotive industry - Seizure of assets of banks that trade in Iranian Rails
Sanctions against third parties (2017~ 2017) - Iranian IP filtering 2017 - Sanctions after the withdrawal of the United States from JCPOA ⁷ 2016 - Sanctions on November 5, 1997 - Iran arms embargo and trigger mechanism	2013 so far	Obama and Congress - Trump	Sanctions on companies, institutions, banks (168 institutions - 50 banks - IT - universities - judges - Revolutionary Guards - space organizations - civil sector - sanctions on the Armed Forces Headquarters - sanctioned training courses

²Iran Freedom support act(ISLA)³Comprehensive Iran Sanctions, Accountability and Divestment Act (CISADA)⁴National Defense Authorization Act (NDAA)⁵Section 1245 of National Defense Authorization Act FY 2012⁶Iran Sanction Act (ISA)⁷Joint Comprehensive Plan of Action (JCPOA)

Table 3: Changes in Exchange Rate in the Last 32 Years: Source: Online Economy Website⁸[13]

year	Exchange rate (Rial)	Year	Exchange rate (Rial)	year	Exchange rate (Rial)	year	Exchange rate (Rial)
67	960	77	6460	87	9660	97	120000
68	1200	78	8630	88	9670	98	157500
69	1410	79	8190	89	10440	99	250000
70	1420	80	8000	90	12040	00	270000
71	1490	81	8010	91	26070	01	490000
72	1800	82	8320	92	31830	02	500000
73	2660	83	8740	93	32800		
74	4070	84	9040	94	34500		
75	4440	85	9220	95	36500		
76	4780	86	9350	96	48000		

⁸<https://www.eghtesadonline.com/%D8%A8%D8%AE%D8%B4->

variables in the economic environment over time, as well as the obvious and hidden goals of the West from the dispute in the region, in order to manage the crises it faces, this study seeks to model the goals of the west from the nuclear dispute with Iran using the systemic dynamics approach.

2 Literature Review

In this section, we discuss the theories, views, and approaches to the problem.

Game Theory

Game theory is a branch of applied mathematics; that it began in the 1920s with the work of John Forbes Nash, Van Neumann, and Emile Bohr, they sought to identify the potential economic and military applications of game theory [27].

Systemic Thinking

The specific ways in which a systemic approach is used to describe and give meaning to complex situations, is called systemic thinking and . When describing a system as interconnected and internal components, it should be borne in mind that any representation of a system is necessarily considered as a simplification. The fundamental question is not whether these representations are "correct" or "incorrect," but also the question is whether the basic aspects of a situation are achieved in relation to a particular goal or situation? In other words, systemic thinking is a tool to give meaning not only to a tree and the forest that surrounds it, but also to the view that the forest is inside and there is the space and atmosphere that provide important resources for the vital activity of the tree. And considering this tree is a small part of the global exchange processes [33]. Paying attention to the three concepts or elements of interrelationships, perspectives and boundaries is the best way to understand the essence of systemic thinking [33].

Causal Loop Diagrams

Causal Loop Diagrams (CLDs) are an important tool for showing the feedback structure of systems that have been used in academic research for many years and are increasingly used in business and commercial problems. Causal loop diagrams are important for the following reasons:

- A. Obtain your hypotheses about dynamics
- B. Extract and create the mental models of individuals or teams
- C. Linking important feedback that you think is the cause of the occurrence of the problem.

A causal diagram includes variables that are linked by directed lines to express causal effects between the variables. This diagram also identifies important feedback loops. Figure 3 shows an example that is important in symbolization [35].

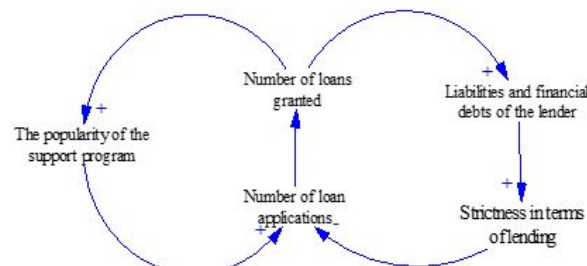


Figure 3: Causal Loop Diagram for small (loan) lending scheme [33]

System Dynamics Approach

The system dynamics approach was introduced in the early 1960s by J. Forrester from MIT University, a technique for analyzing the systems and solving complex problems using computer simulation. It can be said that the most important principle that the dynamics of systems state is that feedback constitutes the behavior of the system and the dynamics of the behavior of the system is derived from the behavior of the system [6]. System dynamics is a methodology based on feedback systems borrowed from control theory and can easily manage the nonlinearity and time lag and multi-loop structures of complex and dynamic systems [4]. Forrester intended to combine the strengths of the human mind and the capacity of computers by modeling, that is, to compensate for that uncertain part of our knowledge from systems using mathematical precision. The concept of system dynamics is based on the idea that systems consist of elements which have a value ("state") at a given time that can change over time through input and output flows. For example, in a bank account, the savings are a cumulative (state) variable, while the income and expenses are input and output flows. The dynamic behavior of a system is explained by the relationship between state and flow variables, which is represented in the form of a state-flow diagram. The components and elements of this diagram are: state variable, flow variable, boundary, auxiliary variable [33].

System Dynamics Logic

System dynamics logic is different in different stages of the research cycle of system dynamics studies (Figure 4). First, the models are compared by existing information (deductive logic) and then used for simulation (inductive logic). The system dynamics can be divided into different approaches based on the deductive and inductive nature of the modeling steps; because in some, only inductive or deductive or both occurs.

2.1 Experimental Background of the Research

Previous research has not explicitly provided a model for analyzing the goals of the West in the nuclear dispute with Iran. Research has been conducted in this field, which has examined the issues related to the nuclear problems and the problem related to it, as well as the fluctuations of various economic variables resulting from different sanctions (nuclear sanctions have been among them) from different perspectives, in this section, the most important of them are mentioned. The research has been used to collect the model variables as well as factors affecting the problem variables, which have been used in the construction of causal loop diagrams and the final model.

Thani Abadi in [29] investigated the existing literature and identified the different views on Iran's nuclear issue in the categories of history-based, law-based, outcome-based, solution-based, and motivation-based. This author in another article entitled "Exploring the Nuclear Policy of Islamic Republic System" has dealt with the motivation-based effects of this issue.

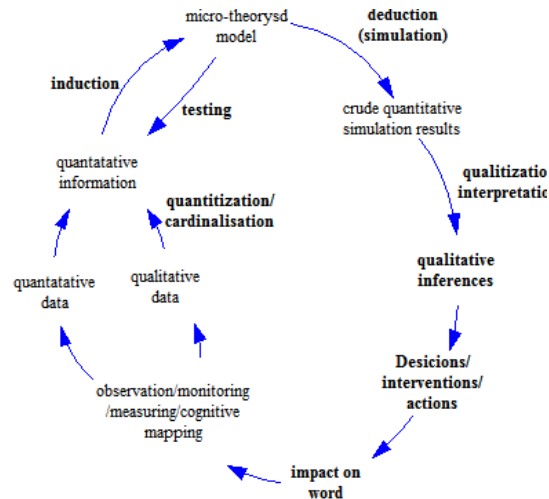


Figure 4: Research Cycle of System Dynamics [28]

Ali Omidi et al. in [26] have provided a new explanation of the confrontations of the West in the nuclear program based on the game theory. Dolatabadi and Jalilvand have represented a model for dynamic analysis of the causes of future wars using the system dynamics approach [34].

Jamshidi in [16] sought to answer the question of what has been Washington's assessment of Tehran after the nuclear deal. And what effect will this assessment have on the prospect of strategic competition between Iran and the US in the region?

Sadeghi Jaqeh in [15] examines the events and trends observed in Iranian society in connection with the nuclear negotiations and the JCPOA, the role of some overt and covert functions of the nuclear negotiations, the decision-making mechanism within the Iranian political system, announcing the positions of reference groups and citizen participation in strengthening or weakening the social capital in the country.

Massoud Mousavi Shafaei and Farzaneh Naqdi in [24] examine the economic conditions and crises in Iran, especially economic institutions such as banks during the embargo and then the challenges and economic opportunities ahead in the post-sanctions situation. The article is in two sections: 1. Theories of sanctions and types of sanctions and their effects on the economic and trade system, especially the Iranian banking system, and 2. Opportunities and agreements arising from the JCPOA agreement are mentioned.

The paper [5] has dealt with the impact of sanctions and openings resulting from the JCPOA agreement in two parts: the effects of sanctions on Iran's economy – the JCPOA and economic openings. Author in [35] uses a model to choose a strategy for this important dispute by considering the goals of the parties in the dispute (intensification and negotiation).

Authors in [21] evaluate 6 strategies of the last 15 years in the field of global nuclear security, including export control reform, NASA model, international fuel cycle, development of international technologies, specialized changes and refocus on diplomacy, and it has analyzed these strategies from the two aspects of the probability of implementation and effectiveness.

3 Research Methodology

Given the nature of the problem studied in the study, the system dynamics approach is used which is a qualitative-quantitative approach [23]. The dominant approach in system dynamics studies is a subset of extended system dynamics, quantitative-qualitative system dynamics models that rely on increased learning, and a subset of interactive system dynamics that seeks to understand the phenomena [25].

In the research, the dynamics approach of critical pluralism of the system has been used.

The research has used a developmental approach, such that by data mining from the research on Iran-West nuclear dispute and the sanctions, different variables were collected or a specific issue that has been theoretically studied, has been developed as a causal loop model and simulated.

Table 4: Philosophical Foundations of the Dynamics of Critical Pluralism of the System[9]

Ontology	Realist, there is the outside world
Epistemology	1. It is mental (the real world is accessible only by mental models) 2. There is an external reality in the universe that can be partially recognized because of its similar to mental models.
Axiology	The observer is not separate from the observed, and the models depend on context and time, the modeling consciously begins with the value issue, and all steps of problem selection, methodology, basic assumptions and model boundary determination will be value-oriented.
Methodology	Quantitative and qualitative.
Anthropology (human nature)	Creative people with unrealized potential and in the trap of illusion, conditional independence and freedom of choice, structurally limited, but restrictions can be lifted [26]
Causality	It is a key element because it produces the model behavior through simulation by establishing the relationship between modern elements in comprehensive structures, which is considered as an explanation for external reality (discovery of elite structures produces the specific patterns of events)
Logic	Deductive (because models are derived from mental models and is inductive because simulation operations are performed on analogous models)
Measurement scales and operations	Quantitative and qualitative
Interpretation of results	Quantitative simulation results are qualitatively described to increase the understanding of dynamic structures (quantitative interpretation is more important here).
Validation	The degree of credibility (trust), chorus (including correctness and agreement) and morality, in addition to the strategy of change action, which is assumed as the axis, until if the actors succeed, the model is considered as a valid model [13].
Best model	It is a model that is useful in changing the mental models and structures of the real world and can gain the trust of users (increasing the understanding and learning about structures)
The right strategy	It must have real potential to improve the behavior of structures

The steps of the modeling process of system dynamics approach is based on Sterman methodology according to Figure 5.

The Main Question of Research

What are the causal loops that cause the nuclear dispute with Iran?

Modeling Method:

Development and drawing of the causal loop model in the software space of Vensim according to the collection of documents and logic between the collected data.

Develop a Dynamic Hypothesis to Explain the Problem

The study examines the problem of the Iran-West nuclear dispute and the way of relating this problem to the goals of the Western world. Another goal of the study is to model the goals of the West from the nuclear dispute with Iran. At first, the connection between the crises of the West (especially US) and the management of the developments in the Persian Gulf region is shown, and in this regard, the implementation of the project of the passageway of civilization and the best and most efficient tool for this project (increase in the price of oil - enough and in a relatively long time)

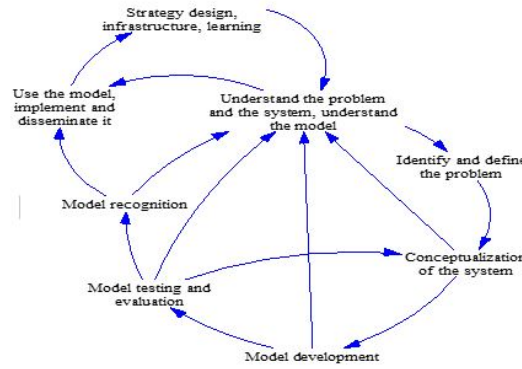


Figure 5: Overview of System Dynamics Modeling Approach [22]

has been shown, which Iran is considered as an important player to implement this project⁹ and the problem of the Iran-West nuclear dispute is also considered as a real problem and a conceptual model of research, which can be seen in Figure 6.

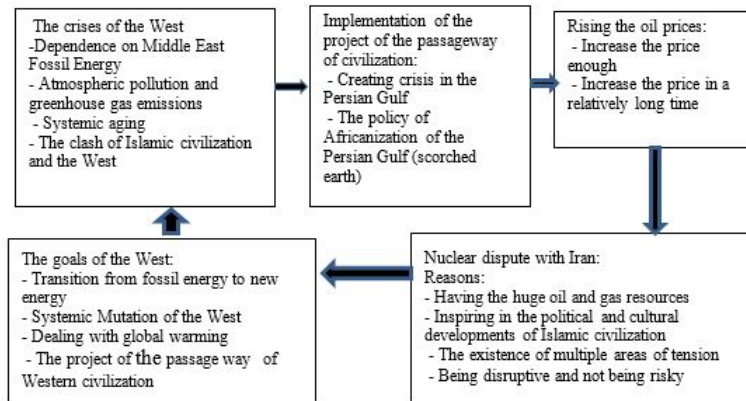


Figure 6: Problem of Iran-West nuclear dispute

Time Domain and Boundary of Model

The model boundary diagram determines the model domain by listing the variables inside the model (endogenous) and the variables outside the model (exogenous). Table 5 shows some of the dynamic boundary variables constructed for the comprehensive model of the goals of the West from the nuclear dispute and the model of the impacts of the nuclear dispute on the exchange rate. These variables have been collected through the study of previous research foundations. The time considered for expressing the root of the problem is from 1978 to 2021.

4 Results and Discussion

Develop the System Model according to the Root of the Problem

In this section, the following cause and effect diagrams are presented in response to the main question of the research. The models are research findings that show how the goals of the West, especially the US, relate to the problem of the nuclear dispute with Iran. Each model shows the way of resolving each of the crises mentioned in Figure 6, including:

⁹For more information in this regard, refer to the book "Political Economy of Iran Nuclear Dispute" by Dr. Mohsen Renani. This book has been a key source of data mining in the development of a comprehensive model.

Table 5: Model boundary diagram

Row	Variable	Type	Row	Variable	Type
1	Oil Price	Exogenous	30	Iran's gas production capacity	Exogenous
2	Gas Price	Exogenous	31	Trade deficit	Exogenous
3	US Exports	Exogenous	32	Dollar reserves of other countries in the United States	Exogenous
4	Energy transition security factor	Exogenous	33	US exports	Exogenous
5	Clean energy production	Exogenous	34	Gas injection into oil wells in Iran	Endogenous
6	Profitability of new energy production	Exogenous	35	Iran's recoverable oil reserves	Endogenous
7	China and India coal consumption	Exogenous	36	Iran's maneuvering power in the energy market	Endogenous
8	Greenhouse gas emissions	Exogenous	37	Nuclear dispute	Endogenous
9	Pressure on China and India	Exogenous	38	Currency demand	Endogenous
10	China and India taking advantage of the dispute	Exogenous	39	Currency supply	Endogenous
11	Long-term gas purchase contracts from Iran	Exogenous	40	Consumer behavior	Endogenous
12	Continued growth of Chinese and Indian economies	Exogenous	41	Government spending	Endogenous
13	Financial support of Islamic civilization	Exogenous	42	Deposit	Endogenous
14	The project of the passageway of Western civilization from Islam ¹⁰	Exogenous	43	Currency rules and regulations	Endogenous
15	Military budget Justification of West in public opinion	Exogenous	44	Customs duties	Endogenous
16	Persian Gulf Crisis	Exogenous	45	Safety stock of people	Endogenous
17	Arms sales in the Middle East	Exogenous	46	Production	Endogenous
18	Pressure on major Western industries	Exogenous	47	Imports	Endogenous
19	Systemic aging of the West	Exogenous	48	Oil Product	Endogenous
20	The need for a systemic mutation in the West	Exogenous	49	Development	Endogenous
21	Moving towards a knowledge-based economy	Exogenous	50	Budget deficit in Iran	Endogenous
22	Revolution in technology	Exogenous	51	Inflation	Endogenous
23	Technology efficiency	Exogenous	52	Institutional structural weakness in resource absorption	Endogenous
24	Manpower efficiency	Exogenous	53	Lack of central bank independence	Endogenous
25	Efficiency of social organization	Exogenous	54	Liquidity growth	Endogenous
26	Previous investment in knowledge-based industries	Exogenous	55	Debt growth of the Government	Endogenous
27	Dollar value	Exogenous	56	Foreign debt	Endogenous
28	Print the dollars	Exogenous	57	Oil revenue	Endogenous
29	Capital account in America	Exogenous	58	Moving liquidity to the trading sector	Endogenous

¹⁰Clash of Civilizations is a theory put forward by political scientist Samuel Huntington that according to this theory, after the end of the Cold War, culture and religious identity will be the source of all conflicts.

- Dependence on fossil energy in the Middle East
- Systemic ageing of the West
- The project of the passageway of Western civilization from Islam
- The problem of greenhouse gas emissions and global warming
- Solving the US Trade Deficit Problem
- The survival of the military industry of the West

Model of the Transition of the West from Fossil Fuels to New Energies

Figure 7, which deals with the transition of the West from fossil energies to new energies, shows the relationships between the main variables in the form of 5 balancing loops and two reinforcing loops, for example, the R1 balancing loop shows that as the price of oil rises, the price of gas also increases as an alternative energy, the price of oil also increases by increasing the price of gas, which is considered as a supplement for oil. In the B1 moderator loop, as the price of oil rises, the profitability of investing in new energies increases and the price of oil also falls because of this increase in the profitability of alternative energies, or in the B2 loop, an increase in the price of gas is obtained by increasing the price of oil. And then the safety factor of the transition to new energies (for the survival of the industries of the West) also increases with increasing the gas production capacity. The profitability of investing in new energies increases as a result of this increase, and the end result is a drop in the price of oil. In the B6 moderator loop, coal consumption increases in India and China as a result of rising the price of oil due to sanctions. Therefore, long-term contracts to buy gas from Iran will increase by China and India taking advantage of the nuclear dispute and circumventing the sanctions and US softening against them, in order to continue to grow the Chinese and Indian economies, and the safety factor of the transition from fossil energies to new ones will increase (continued economic growth of China and India is important for the Western world to prevent the damage from the recession in these two countries along with their demographic problems) and consequently, the profitability of investing in new energies will increase and then the price of oil will fall.

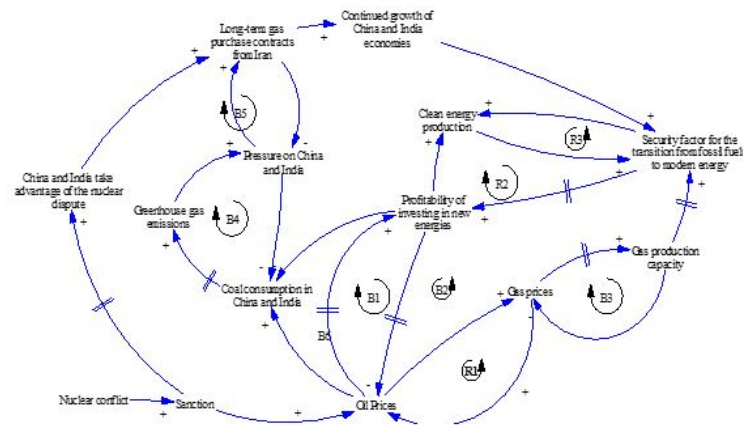


Figure 7: Cause and Effect Model of the Transition of the West from Fossil Energies to Clean Energies with the Help of Nuclear Dispute

Cause and Effect Diagram of US Trade Deficit by Raising the Price of Oil

In Figure 8, in the R4 amplifier loop, as the price of oil rises as a result of sanctions, the value of the dollar falls and the dollar devaluation increases the price of oil. In the R5 amplifier loop, the dollar devaluation will cause the dollar to print more. This printing of the dollar lowers the US trade deficit, and the lowering of the trade deficit leads to a decrease in the printing of the dollar, which in turn leads to an increase in the value of the dollar. Finally, an increase in the dollar value also lowers the price of oil. R6 amplifier loop raises the value of the dollar by lowering the dollar rate, increasing the printing of the dollar, reducing the trade deficit, increasing the dollar reserves of other countries in the US, and then increasing the capital account in the US.

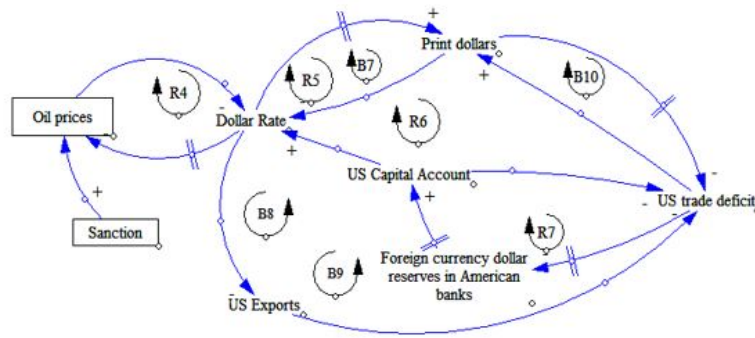


Figure 8: Cause and Effect Model for Solving the Problem of US Trade Deficit by Increasing the Price of Oil

Cause and Effect Diagram of the Systemic Leap of the West Using the Nuclear Dispute with Iran

One of the existing crises in the West that has been mentioned is the systemic ageing of the West¹¹, The West is looking for a systemic leap that wants to do this systemic leap through pressure on its large industries (to get rid of energy dependence). Due to the fact that eliminating these industries addiction to energy cannot be done with the recommendation and issuance of circulars and the like that, therefore, creating pressure by raising the price of oil must realistically be done (raising the price of oil through a dispute - in the current situation, a nuclear dispute with Iran). As a result of pressure on large industries of the West, these industries are forced to move towards a knowledge-based economy due to the rising costs. Achieving a knowledge-based economy requires increasing the efficiency in the three elements of technology, manpower and social organization.

The strengthening factor of these three elements has been done as the previous investment in knowledge-based industries, which is shown in the loops R8-R9-R10. In the B11 moderator loop, sanctions increase through the nuclear dispute, and sanctions have a direct impact on the price of oil. Raising the price of oil puts pressure on large industries of the West in the same direction, and this causes a shift toward a knowledge-based economy in a positive direction, which shows the impact on the systemic ageing of the West in the opposite direction and also reduces the need for a systemic leap, and ultimately this issue reduces the dispute (The West has chosen Iran because of being disruptive, not being destructive (being intervener)).

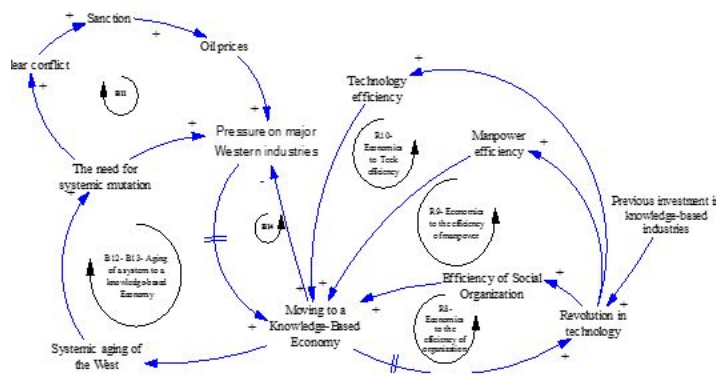


Figure 9: Cause and Effect Model of the Systemic Leap of the West, Especially US, with the Help of the Nuclear Dispute with Iran

Cause and Effect Diagram of the Survival of Military Industries of the West Using Nuclear Dispute

In Figure 10, for example, the R13 amplifier loop shows that the West, by creating a nuclear dispute with Iran, justifies public opinion for the allocation of military budgets, and accordingly, the survival of the military industry of

¹¹Among the signs of systemic ageing in the West, we can mention the age and qualitative ageing of the population - decreased system controllability - the need to absorb power from outside the system - decreased internal capacity of system upgrade - continuous deficit in system energy level - decreased satisfaction capacity of the system. The most important thing is to reduce the West’s share of the world economy. For further reading in this field, refer to the book ”The Political Economy of the Nuclear Dispute of Iran, an Introduction to the Passageway of Civilizations” by Mohsen Renani.

the West continues. With the survival of the military industry of the West, arms sales in the Middle East will increase and the Persian Gulf region will become more critical, which will also exacerbate the nuclear dispute. In the R16 loop, as the crisis in the Persian Gulf increases, the price of oil will rise.

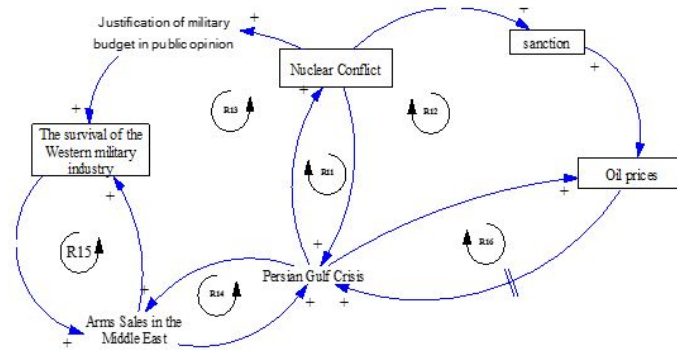


Figure 10: Cause and Effect Model of the Survival of Military Industries of the West with the Help of the Nuclear Dispute

Cause and Effect Diagram of the Project of the Passageway of Western Civilization with the Help of Iran Nuclear Dispute

In the B15 moderator loop, using the sanctions and raising the price of oil, and as a result of China and India taking advantage of the nuclear dispute, long-term contracts to gas buy from Iran by these two countries will increase, and thus, the amount of gas injected into oil wells decreases during this period. Thus the extractable resources of oil are reduced, and this in turn leads to a reduction in the material resources of Iran as a country with the pattern (model) of material support of Islamic civilization. In addition, Iranian gas will be sold at a lower price due to the lack of bargaining power during disputes and sanctions, which will reduce Iran’s manoeuvrability in the energy market. And this continues to the extent that the West no longer needs fossil energies and it is used in line with the policy of Africanization of the Middle East and the project of the passageway of Western civilization from Islam.

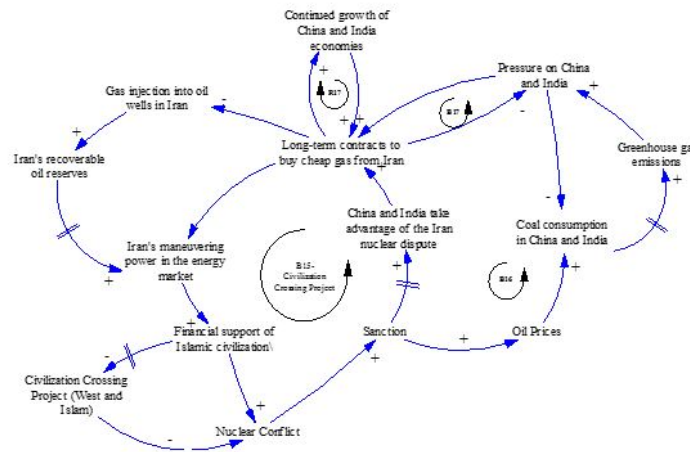


Figure 11: Cause and Effect Model of the Project of the Passageway of Western Civilization

A Comprehensive Cause and Effect Model of the Goals of the West from the Nuclear Dispute with Iran

Figure 12 shows a comprehensive cause and effect model of the goals of the West from the nuclear dispute with Iran. Iran-West nuclear problem is a dynamic problem that the West uses to address the crises that is currently facing. As can be seen in the model, the goals of the West from the Iran nuclear dispute are shown in the form of a cause and effect diagram.

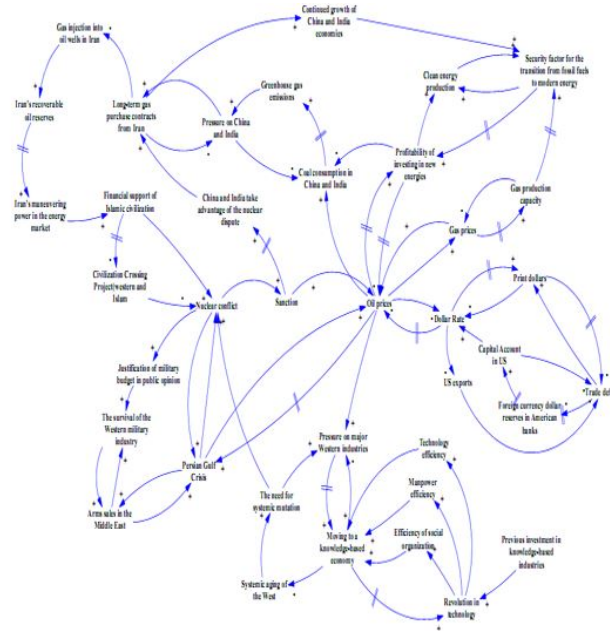


Figure 12: Comprehensive Cause and Effect Model of the Goals of the West from the Nuclear Dispute with Iran

Model Validation

According to the history of the Iran-West nuclear dispute and according to the analysis of researchers' studies as well as the reports of the US Energy Information Administration in 2018, the model was measured using real evidence, which is mentioned below. Figure 13, which deals with oil exploration and production from 1950 to 2050, shows a declining trend in exploration and production, which this is evidence of the transition goal of the West from moving towards new energies. Figures 14 and 15, from reports of 2008 and 2018, show the rate of change and reduction in energy consumption intensity and oil consumption intensity in OECD¹² countries, this also shows the transfer of consumption from fossil energies to clean energies by countries such as China and India, which have large populations, and managing their energy demand is very important for the West. In Figures 16, 17, the forecasting of the combination of different energy consumptions in the two reports aforementioned shows a much faster change than the previous forecasting.

Model Test

Ensure that the model reflects the behavior observed in the real world.

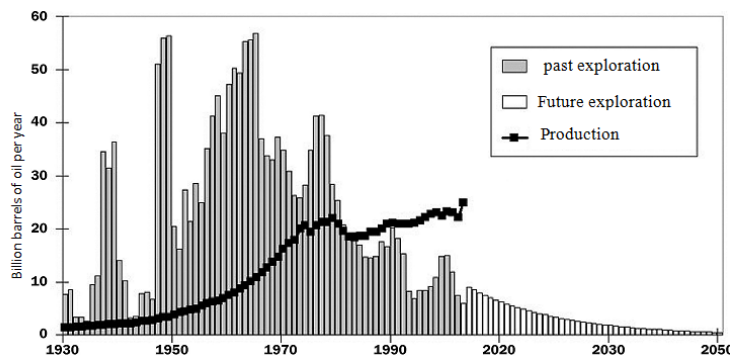


Figure 13: Oil Exploration and Production: 1930-2050 (Billion Barrels per Year) Source: (ASPO 2008)

¹²Organization for Economic Co-operation and Development. Economic Cooperation and Development Organization with 14 members

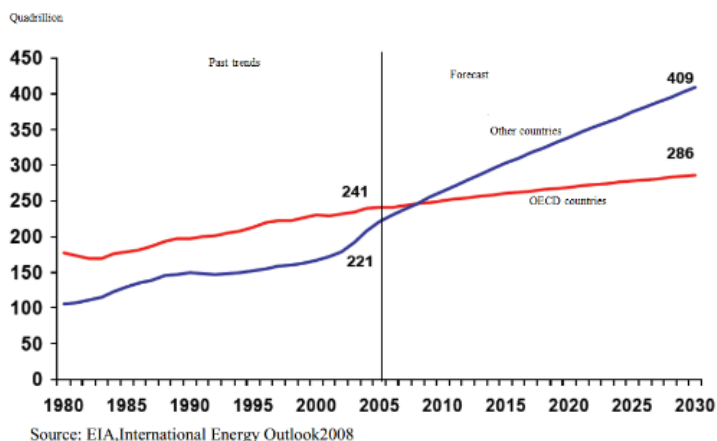


Figure 14: World Energy Consumption Forecasting separately sorted by OECD Countries and Other Countries, Source: (EIA, International Energy Outlook 2008)[7].

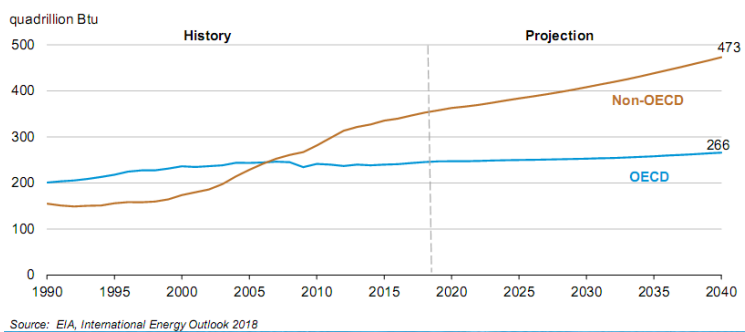


Figure 15: World Energy Consumption Forecasting separately sorted by OECD and Other Countries, Source: (EIA, International Energy Outlook 2018) [12].

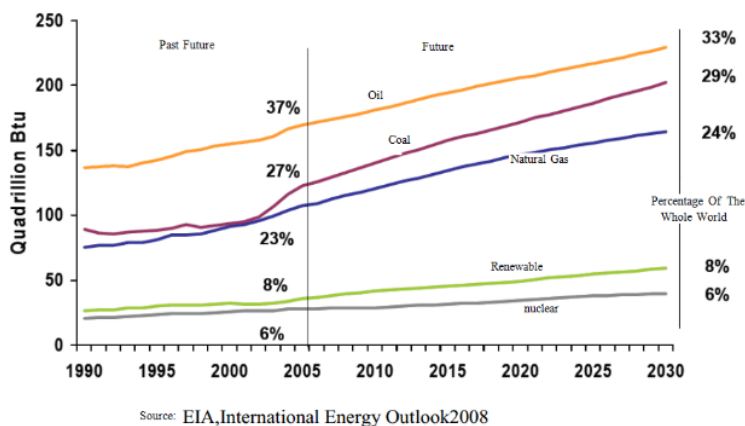


Figure 16: World Energy Consumption Forecasting separately sorted by Energy Types, Source: (EIA, International Energy Outlook 2018) [12].

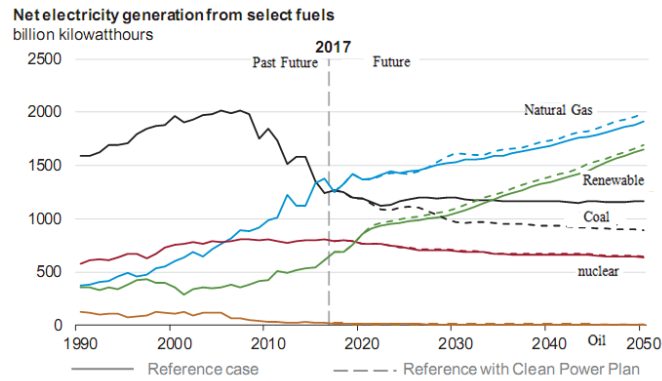


Figure 17: World Energy Consumption Forecasting separately sorted by Energy Types, Source: (EIA, International Energy Outlook 2018) [12].

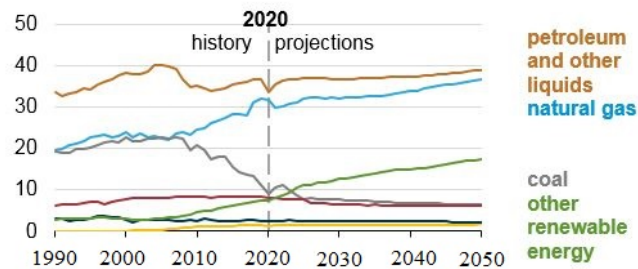


Figure 18: World Energy Consumption Forecasting separately sorted by Energy Types, Source: (EIA, International Energy Outlook 2021) [12].

5 Conclusions and Recommendations

In the research, it has tried to show the way of relating the goals of the West to the Iran nuclear dispute, using the system dynamics approach, and with the help of library studies in previous research and to develop a series of cause and effect diagrams as a comprehensive model, this model uses the system dynamics approach to properly show the cause and effect relationships and to simulate the behavior of system variables.

The boundaries of the system and its exogenous and endogenous variables have been identified by studying the research that has a relatively relevant field. By data mining on the specific problem of Iran nuclear dispute, it also became clear that the West has been involved in crises such as systemic ageing and needs to create a systemic leap by putting pressure on industries – exit from dependence on fossil energies and increase the safety factor during the transition era to new energies – the project of the passageway of Western civilization from Islam - the survival of the military industry of the West and justification of the military budget in public opinion and the goal of eliminating the US budget deficit and creating the tension in the influential region of the Islamic Middle East has been the solution this issue in different eras. Given the importance of Iran as the pattern (model) of Islamic civilization on the one hand, and the influential power of energy supply in the world, and on the other, the existence of a problem called Iran's nuclear program and the existence of numerous areas of tension with neighbours and finally, given that the nuclear dispute with Iran will be manageable for the Western world, the West and especially the US are seeking to achieve their goals, which is to eliminate the aforementioned crises by choosing this game. These 5 goals have been expressed through cause and effect diagrams and have developed a comprehensive model by combining them with the help of other identified variables. Finally, in order to prove the goal of the Western world, by presenting the US Energy Information Administration reports in 2008 and 2018 and comparing them with each other, the speed of getting rid of oil dependence and moving towards new energies and the systemic leap of the West in this regard are shown. Given the detailed nature of the issue of the impact of the Iran-West nuclear dispute on other practical variables in the economic environment of Iran, it is suggested that the basis of future research be in the following areas:

- Cause and effect study of the impacts of Iran-West nuclear dispute on the exchange rate trend in Iran using the systemic dynamics approach

- Cause and effect modeling of the impact of Iran-West nuclear dispute on the trend of foreign investment rates
- Development of various scenarios to resolve the Iran-West nuclear dispute

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