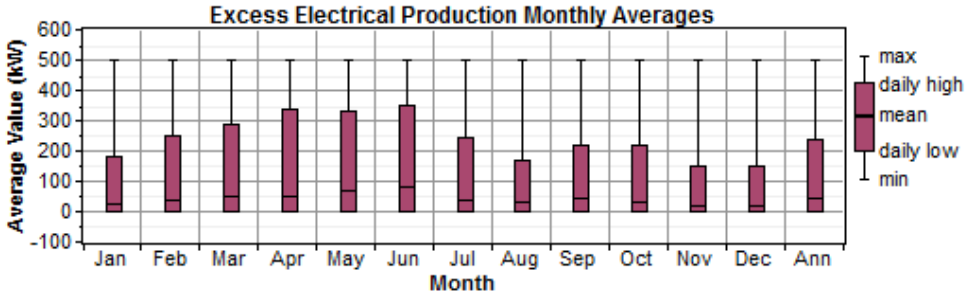

Figure 8. Excess electrical production monthly averages

After presenting the technical feasibility of the proposed hybrid system, it is time for the economic assessment. It has determined so far that the presented hybrid system is approved in technical terms (producing electricity and hydrogen) but economically, the amount of produced electricity by simulated system must be multiplied by the price of each kilowatt hour in order to calculate the annual income of wind-solar-hydrogen hybrid system. Figure 8 shows the summary of cash flow for simulated system for each of the components used in the system. The colored bars below the zero line are as the income of hybrid system and as a negative cost in order to calculate the total net cost for the system by deducting the cost of the system which includes: the cost of purchase, repair and replacement of equipment.

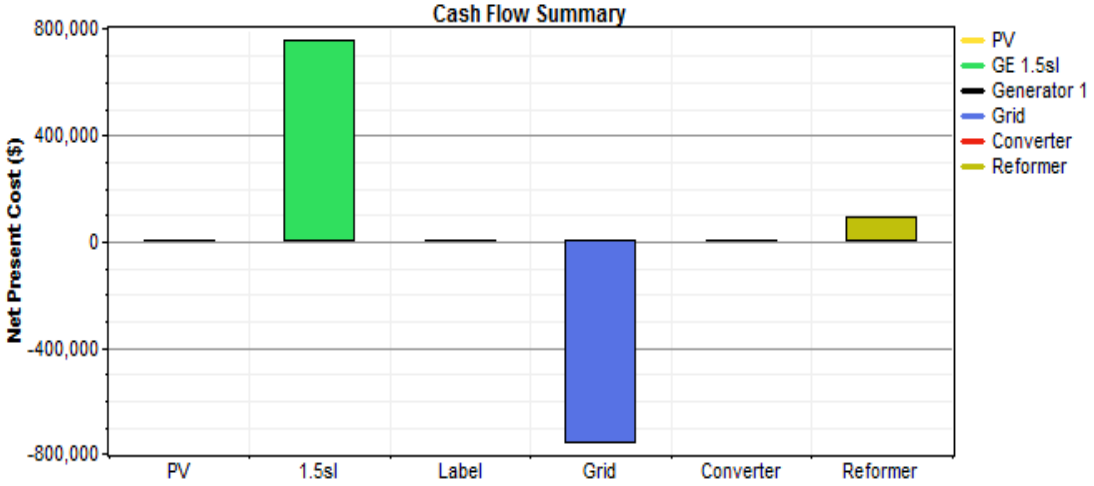

Figure 8. Cash flow summary of feasibility

According to Table 1, the electricity generated by power plants for a turbine, a 4-kilowatt generator and a photovoltaic system are respectively 3137977, 6348 and 9437 kWh per year. In addition, the 31 680 kg of hydrogen produced in the year is derived from it. Two important notes must be expressed for economic assessment of Hybrid power plants' construction project with proposed equipment:

1. Homer software performs feasibility test for only one turbine in large wind turbines (wind turbines with a capacity of more than 1.5 MW) and the operator can expand the system with the necessary number of turbines.
2. Economic feasibility is done for a wind turbine, a generator, a 4-kilowatt photovoltaic system and a hydrogen tank for economic assessment. Then proposed power plant would be consist of a several of these hybrid system.

The new Energy's price per kilowatt is initially required to be determined in order to calculate the income from the electricity produced by the hybrid system. The price of each kilowatt of electricity obtained from new forms of energy is 0.2 dollars (MOE site of Iran, 2016). So we have:

$$R = P_T \times V \quad (1)$$

That in it:

P_T; Electric production per year.

V; Price per 1kw electric production.

R; Net income per year (BCI site of Iran, 2016).

Then: $R = P_T \times V = 3153762 \times 0.2 = \$630752$

Thus, the average annual income of 630,752 dollar is obtained from renewable energy including photovoltaic and wind power for the mentioned hybrid system in the studied area. Meanwhile, 31680 kg of hydrogen per year is obtained from each described photovoltaic-wind hybrid system. Thus, hybrid PV-wind-hydrogen power plant construction in the Hendijan area is economically approved and since the proposal project has been approved in technical aspects, the hybrid power plant construction in the study area is a development opportunity for Renewable Energy.

5. Conclusion

Iran, despite its high potential in renewable and nonrenewable energy sources has not still been significantly evaluated in the field of energy. Assessing the capacity of producing hydrogen in different parts of Iran through wind power plants, photovoltaic or hybrid PV-wind power plants are among important matters which their absence can been seen previous researches. Therefore, this study has been carried out with the aim of feasibility of technical-economic wind-solar-hydrogen power plant using homer software in Hendijan area of Khuzestan province. Initially data on wind speed, air filter indicator, Daily radiation, and data related to the hydrogen system were collected for the studied area. Then, the collected data were entered into the Homer software and were processed. Processes of simulation and sensitivity analysis were performed on data at the time of 2:36 (two minutes and thirty-six seconds) on 7200 simulation. Equipment used in the Wind-Solar-hydrogen hybrid system were a GE 1.5sl turbine, a 4-kilowatt generator, a 4-kilowatt converter, a 4-kilowatt photovoltaic system, a 100 kg hydrogen tank, a 20 kg reformer and 1000 kW electricity grid for a period of 25 years. The results of software processing showed that the studied area has a great potential of renewable energy, especially wind power energy and hydrogen production. According to Homer software the amount of power output of the power plan for one turbine, a 4-kilowatt generator and a 4-kilowatt photovoltaic system were obtained to be respectively equal to: 3137977, 6348 and 9437 kW and 31680 kg of hydrogen were obtained per year. According to conducted technical and economic analysis, the cost of the hybrid system is 1600849 dollars and its annual income equal to 630752 dollars. Thus, it was confirmed that of hybrid PV-wind-hydrogen power plant construction in the Hendijan area is economic.

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