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Performance and Risks in the European Economy

Regional Environment Disparities and Europe 2020 Strategy's Goals

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Abstract: The paper deals with the analysis of the environmental goals' viability in Europe 2020 Strategy. The analysis takes into consideration four indicators: total greenhouse gas emissions, share of renewable energy in gross final energy consumption, primary energy consumption and final energy consumption. The analysis is built on three steps: a comparative analysis between the Member States during 2002-2014, followed by regression analysis and a forecast until 2020. The regression analysis and the forecasts are supported by SPSS19 software. All conclusions of the analysis are illustrated by the latest official statistic data, pertinent tables and diagrams. The main conclusions of the paper are: EU28 is far away of achieving the environment targets for 2020; there are great disparities between the Member States related to the environment policy.

Keywords: greenhouse gas emissions; renewable energy; energy consumption; regional environment disparities

JEL Classification: R10; R11; R19

1. General Approach

The global economy faces to a fabulous challenge: sustainable economic development. From this point of view, environment becomes essential and restrictive for the future economic activities. A developed country has to support better environment for the next generations. As a result, the global environment challenge asks for global solutions because the environment problems are complex. On the other hand, there are many stakeholders involved in both the causes and the solutions to environmental problems. Moreover, the solving of the global environment problems requires changes in consumption and pollution of the natural resources (Harris, 2012).

Other specialists consider that one of the most important concerns of modern life is environment. As a result, the environmental problems have to be solved using global solutions able to guide the national (individual) solutions, as well (Seitz & Hite, 2012).

One of the most balanced approach to environmental science instruction, with bias-free comparative diagrams throughout and a focus on prevention of and solutions to environmental problems was realised by George Tyler Miller (Miller, 2005). The global importance of the environment protection is recognized be EU28, as well. This is why the environment preservation and improvement represent main elements of the Europe 2020 Strategy (European Commission, 2010).

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2. Research Methodology

According to Europe 2020 Strategy, the analysis is focused on four environment indicators: total greenhouse gas emissions, share of renewable energy in gross final energy consumption, primary energy consumption and final energy consumption.

For the beginning, we used comparative analysis of these indicators during 2002-2014. The goal of the analysis is to present the environment disparities between the Member States, focusing of three moments in time: 2007 (last year before the impact of the global crisis), 2012 (year of the economic recovery process) and 2014. In order to do this, we used the latest official statistic data.

The second step of the analysis is the cluster analysis, which is realized to support the idea of grouping the Member States into different clusters. The paper uses two-step cluster analysis, where the distance measure is log-likehood. The number of clusters is specified fixed: 3, while the clustering criterion is Schwarz's Bayesian Criterion (BIC). The paper operates with distinct clusters analysis for each indicator, in order to see if the cluster's quality is at least fair.

Finally, the analysis used a forecast of the four above indicators in order to understand if the Europe 2020 Strategy's environment goals are viable for 2020. In order to realise these forecasts, will use SPSS19 software, under ARIMA method, where the dependent variables are the above four indicators' rates and the independent variables are the years.

3. European Environment Policy's Effects during 2002-2014

Europe 2020 Strategy stipulated that the greenhouse gas emissions should be reduced by 20% compared to 1990. The trend of this indicator is presented in Figure 1.

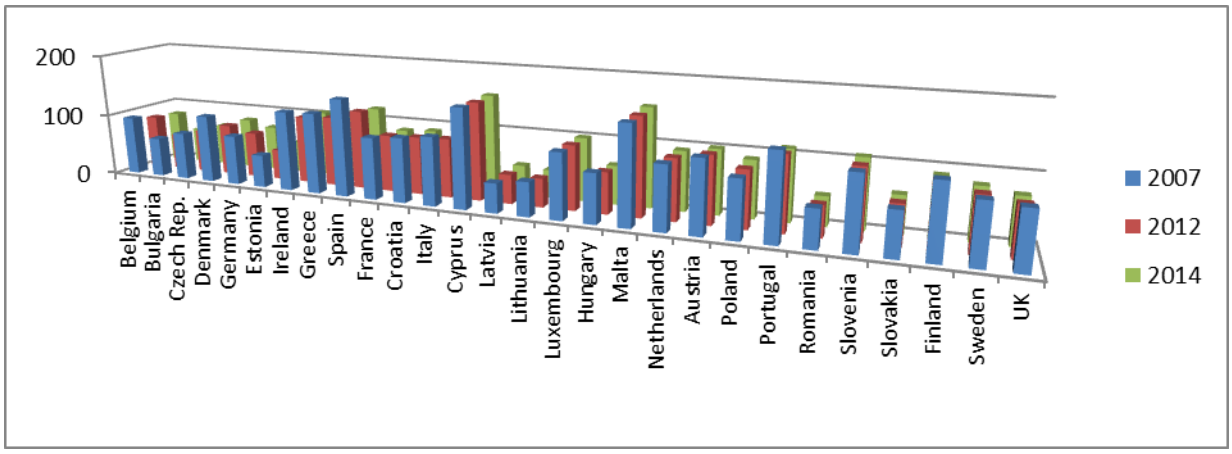


Figure 1. Total greenhouse gas emissions (in CO_2 equivalent) indexed to 1990

Source: personal contribution using EEA 2014 data

According to Figure 1, there are: 11 Member States which will achieve greenhouse gas emissions rates less that 80% (of the level in 1990) in 2014, 9 states with rates between 80% and 100% and 8 states with rates greater than 100%. These states can be grouped into three clusters. The viability of these clusters is made by Figure 2. Figure 2 supports the idea that the above cluster grouping is correct. The cluster quality is good.

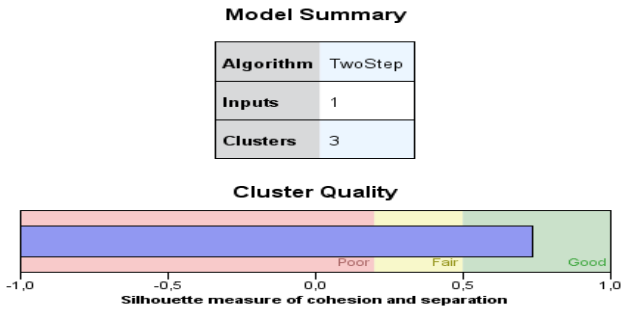


Figure. Total greenhouse gas emissions under cluster analysis in 2014

Source: personal contribution using EEA 2014 data

The same Europe 2020 Strategy talks about an increase of the energy from renewable sources to 20% in gross final energy consumption. Unfortunately, there are great disparities related to this indicator between the Member States (see Figure 3).

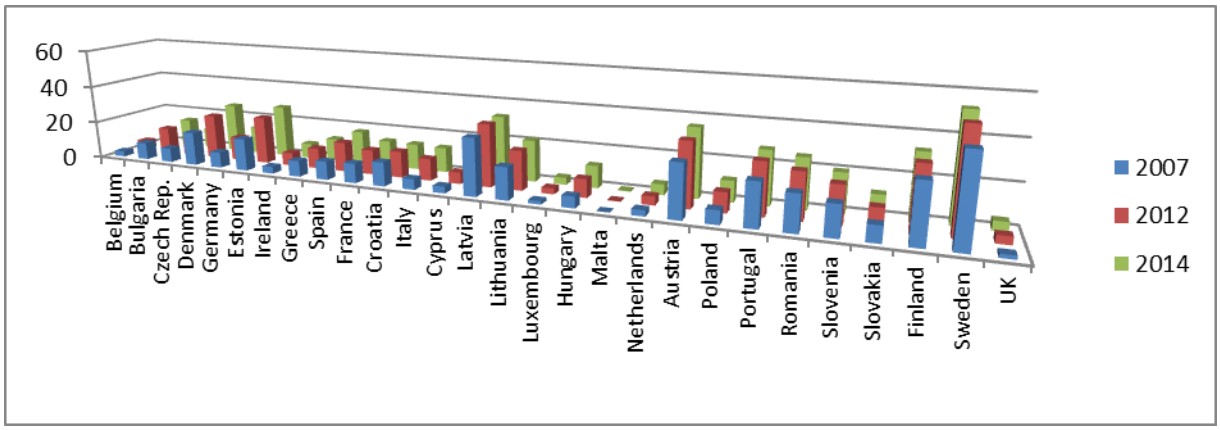


Figure 3. Share of renewable energy in gross final energy consumption (%)

Source: personal contribution using EEA 10.2013 data

Figure 3 allows us to divide the Member States into three clusters in 2014: 7 states with renewable energy in gross final energy consumption less than 10%, 11 states with rates between 10% and 20% and 10 states with rates greater than 20%. The use of cluster grouping is supported by the result of the cluster analysis in Figure 4.

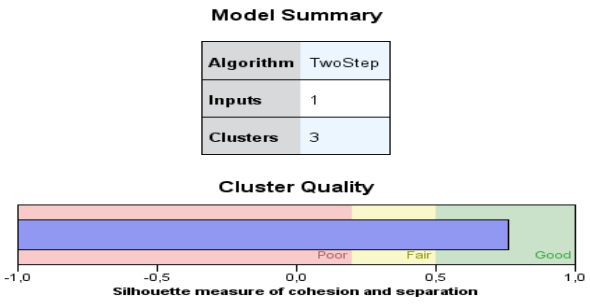


Figure 4. Renewable energy in gross final energy consumption under cluster analysis in 2014

Source: personal contribution using EEA 10.2013 data

Another environmental indicator connected to the new Strategy is primary energy consumption, which has to decrease by 20% until 2014. The level of this indicator in the Member States is far away of the target (see Figure 5).

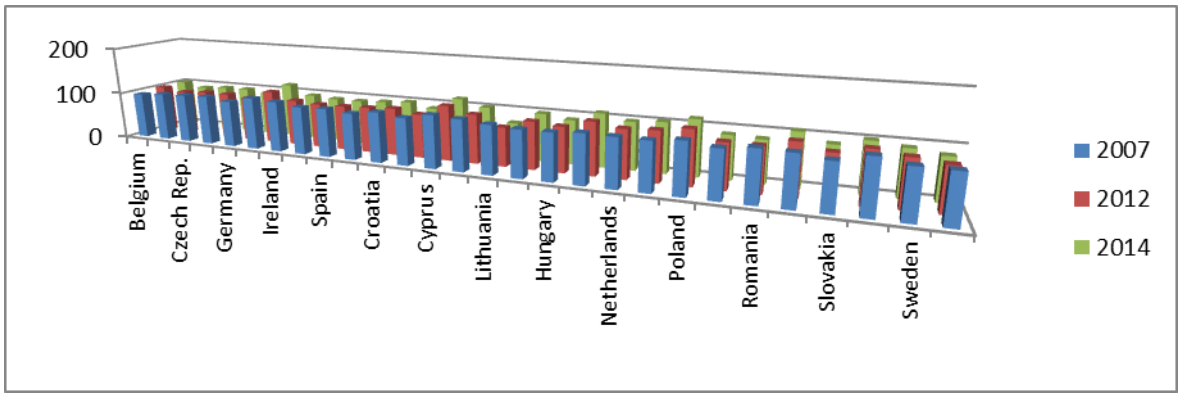


Figure 5. Primary energy consumption (2005=100%)

Source: personal contribution using EEA 09.2013 data

As a general point of view, almost all Member States are not able to achieve the Europe 2020 Strategy goal connected to this indicator. Moreover, the "classic" three clusters grouping can be used again at least for 2014 (see Figure 6). According to Figure 6, the clusters cover: 1 state with primary energy consumption rate less than 80%, 17 states with rates between 80% and 100% and 10 states with rates greater than 100%.

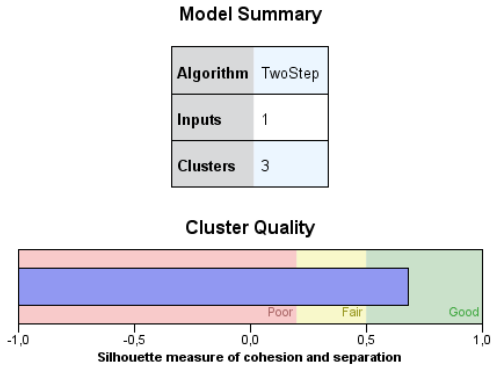


Figure 6. Primary energy consumption under cluster analysis in 2014

Source: personal contribution using EEA 09.2013 data

The last analysed indicator is final energy consumption, which would decrease by 20% in 2020 compared to 2005. Only three Member States will be able to achieve final energy consumption rates lower than 90% in 2014. No one will achieve the target of 80% in the same year (see Figure 7).

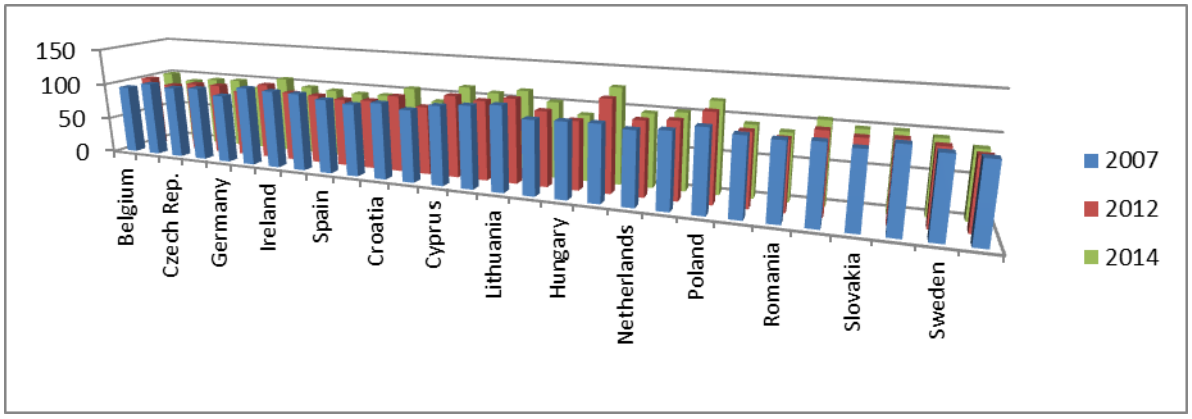


Figure 7. Final energy consumption (2005=100%)

Source: personal contribution using EEA 09.2013 data

Figure 7 supports the cluster grouping in 2014 as: 3 states with final energy consumption rates lower that 90%, 14 states with rates between 90% and 100% and 11 states with rates greater than 100%. The result of the cluster analysis is good (see Figure 8).

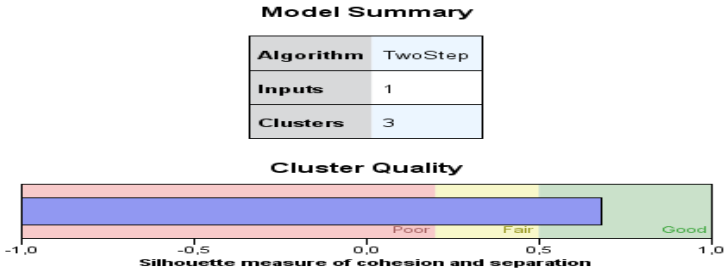


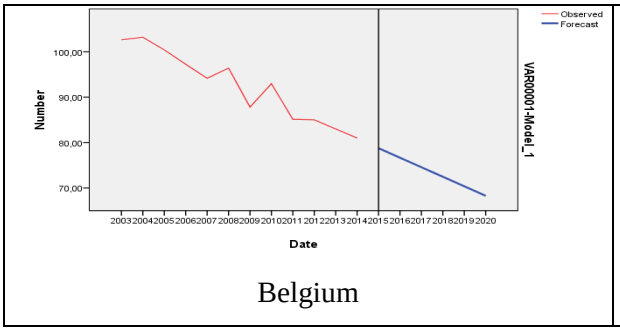
Figure 8. Final energy consumption under cluster analysis in 2014

Source: personal contribution using EEA 09.2013 data

The first intermediate conclusion is that the environment targets for 2020 create great disparities between the Member States in 2014. These disparities allow the states' grouping into three clusters.

4. Europe 2020 Strategy's Environmental Goals Viability

In order to demonstrate the viability of the new environmental strategy, the analysis marks the third step: a forecast of the above four environmental indicators until 2020. The forecasts are supported by SPSS software (see Figures 9-12).



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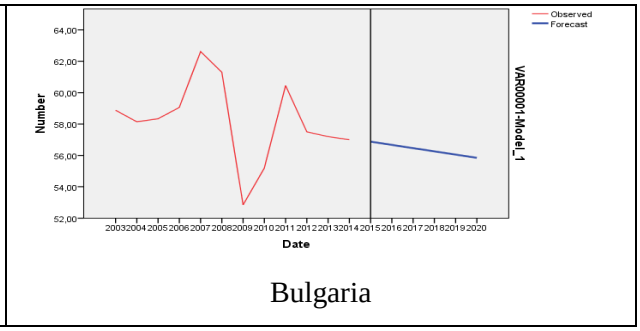

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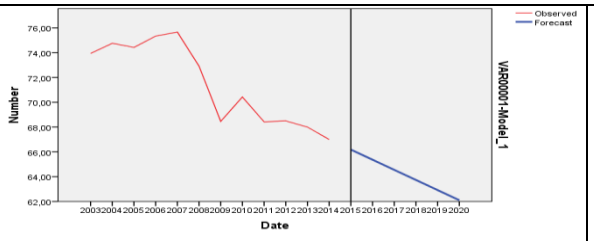

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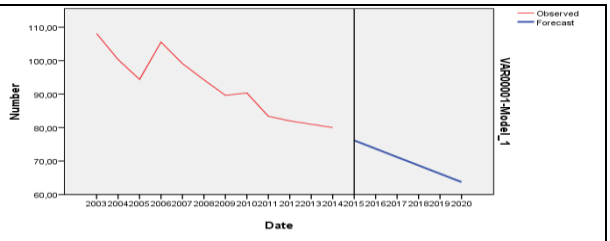

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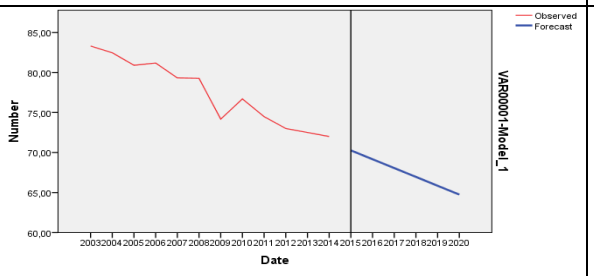

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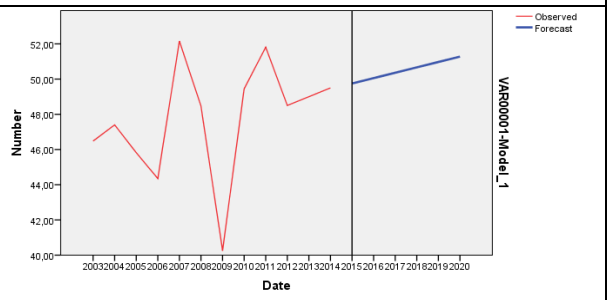

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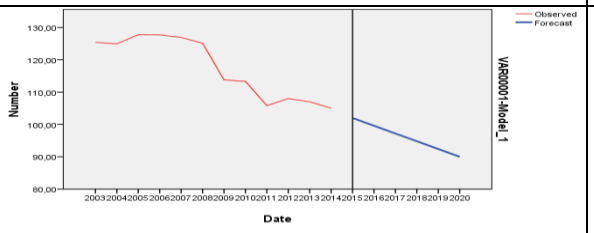

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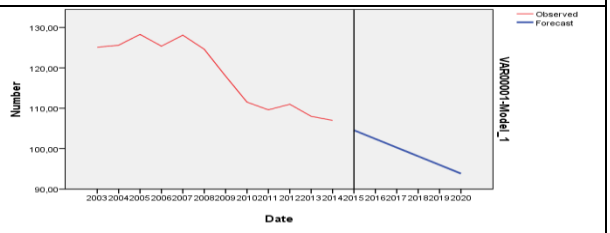

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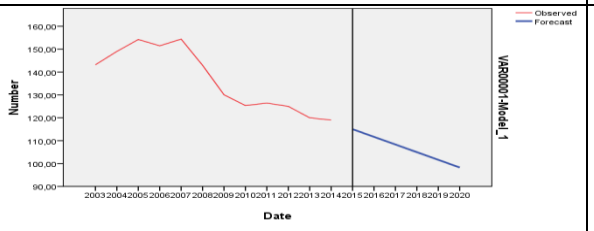

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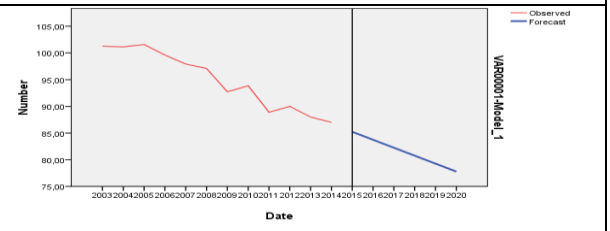

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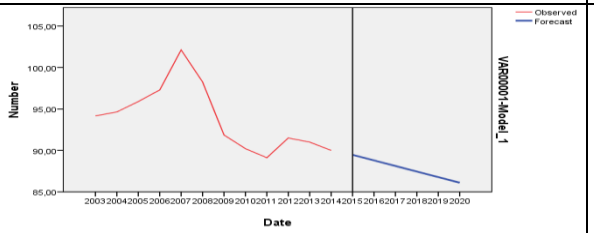

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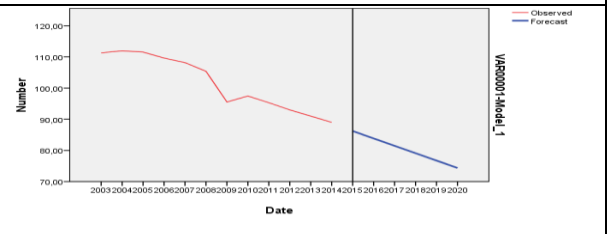

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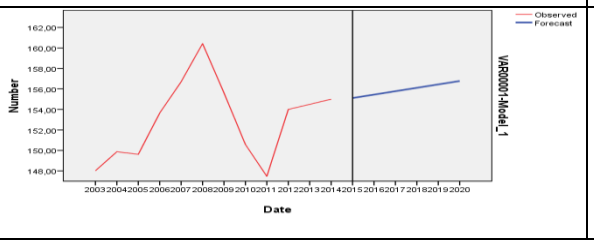

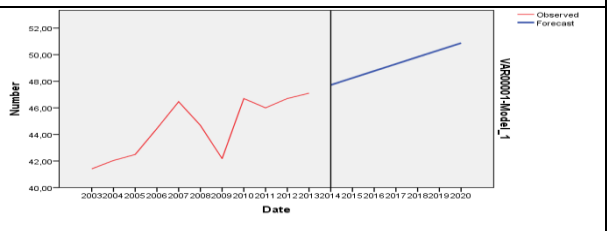

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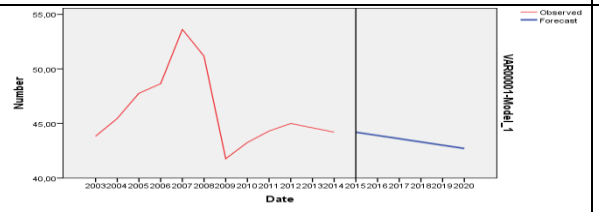	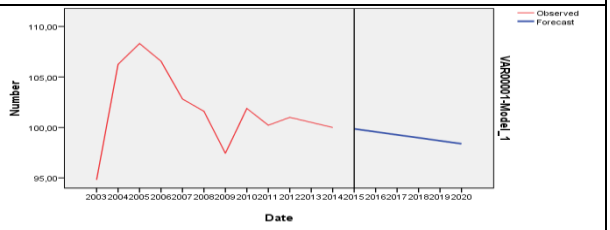
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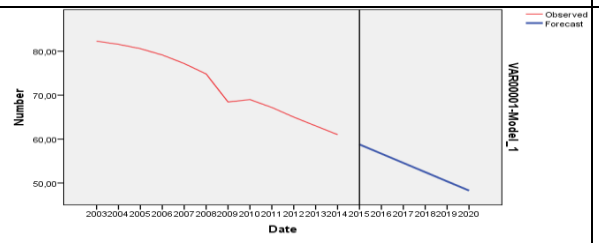	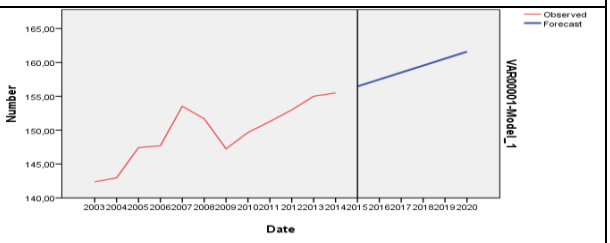
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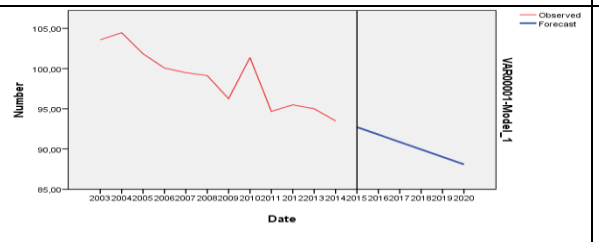	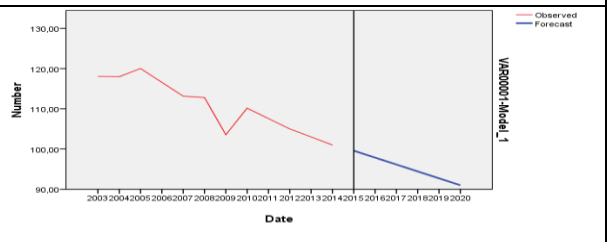
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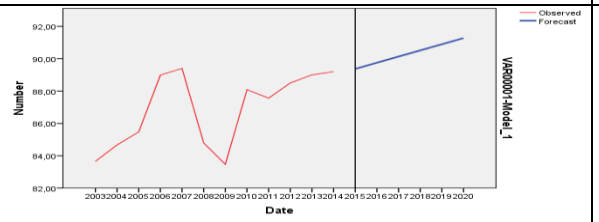	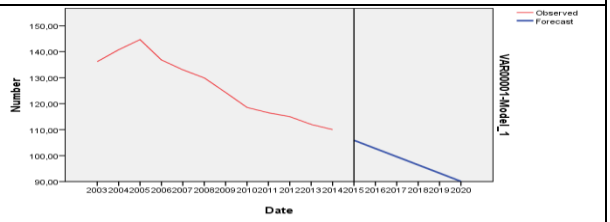
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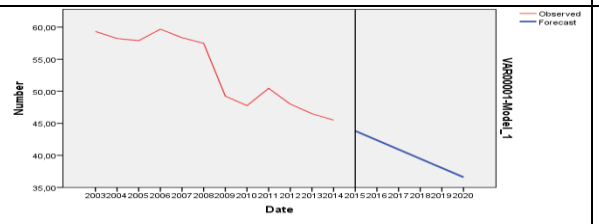	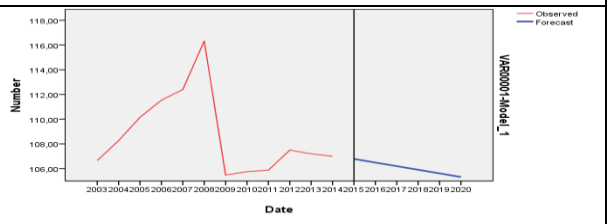
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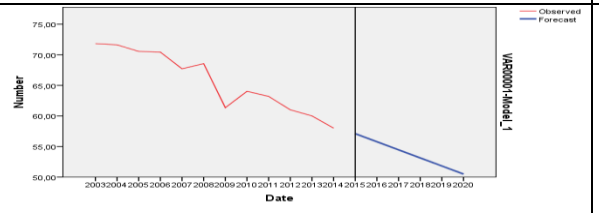	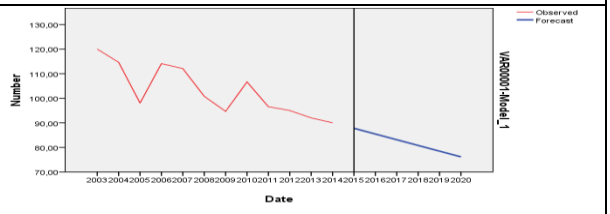
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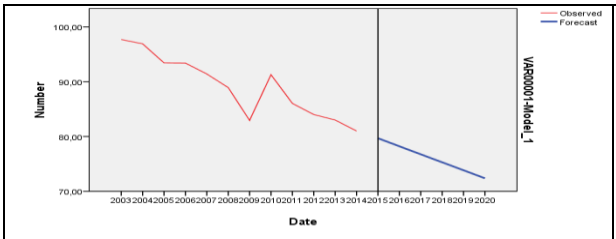

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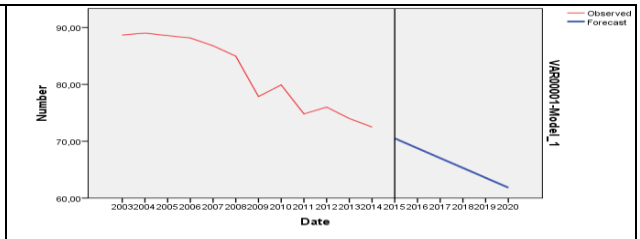
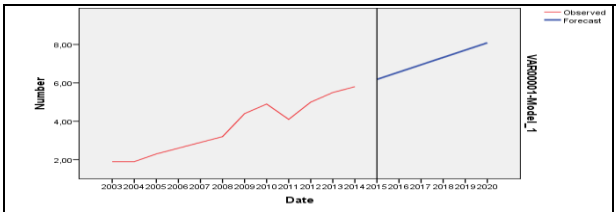


UK

Figure 9. Total greenhouse gas emissions forecast

Source: personal contribution using SSPS19

According to Figure 9, the total greenhouse gas emissions situation will improve in 2020, when: 16 states will achieve emission rates less than 80%, 9 states with rates between 80% and 100% and only 3 states with rates greater than 100%. On the other hand, the initial cluster grouping from 2014 can be applied in 2020, as well. Moreover, 18 states (64.3%) will maintain their adhering to a specific cluster from 2014 in 2020. A different forecast was made in order to see the trend of the renewable energy in gross final energy consumption (see Figure 10).



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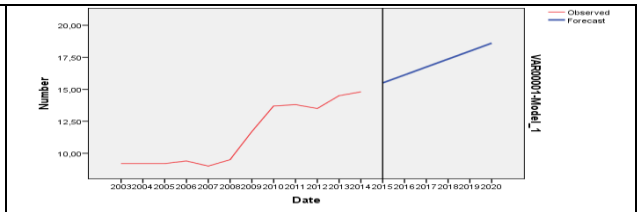

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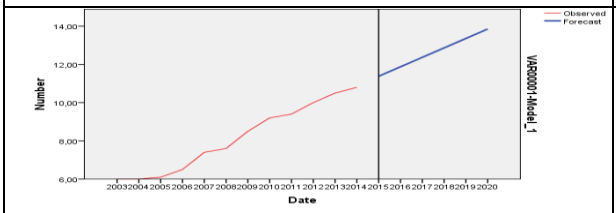

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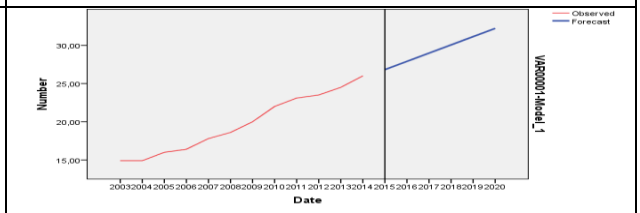

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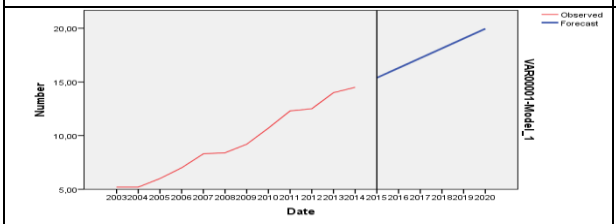

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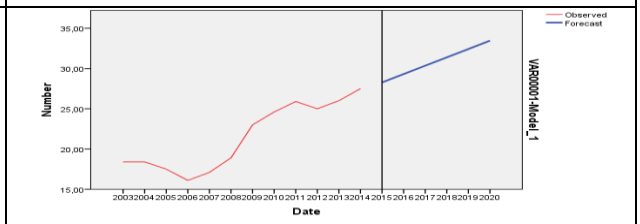

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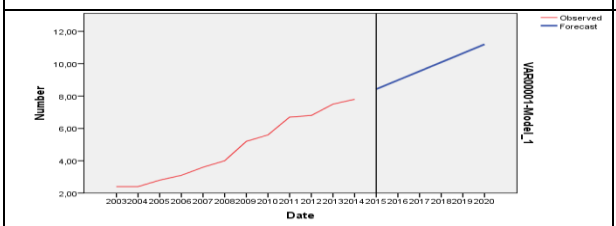

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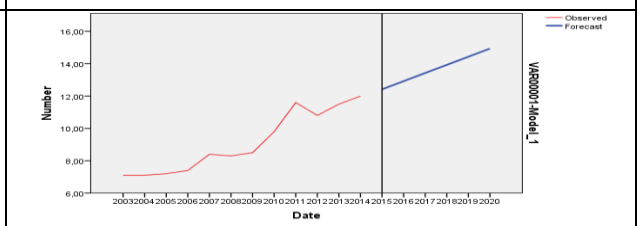

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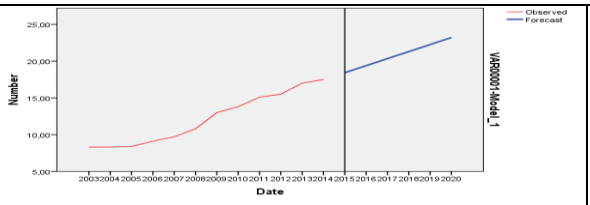

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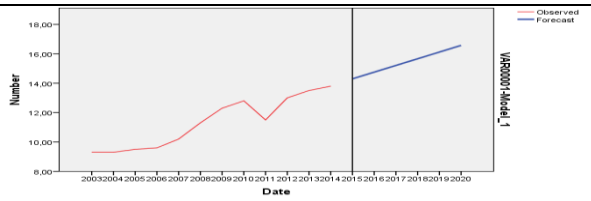

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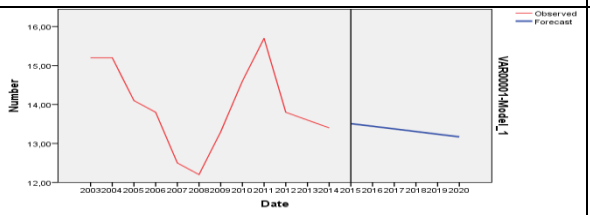

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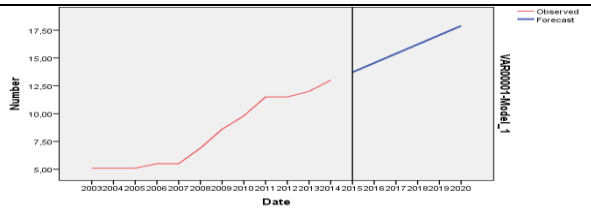

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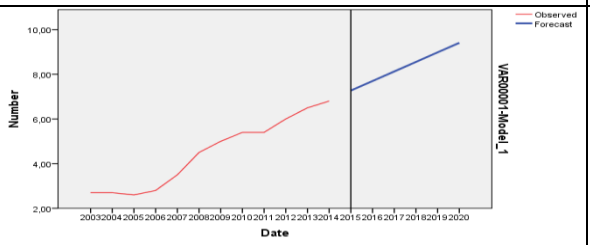

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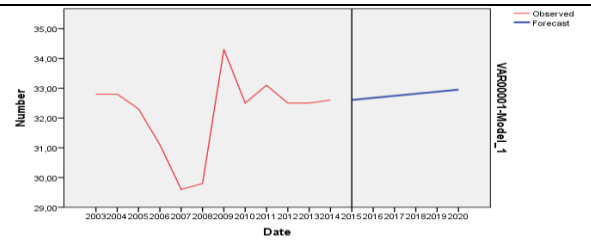

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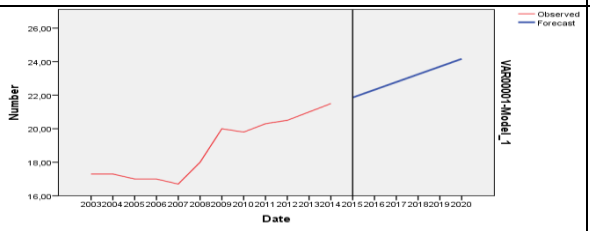

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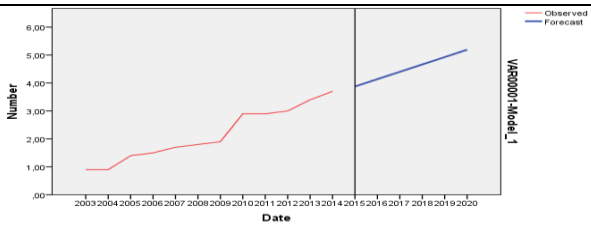

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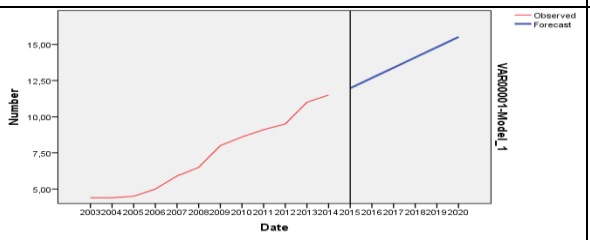

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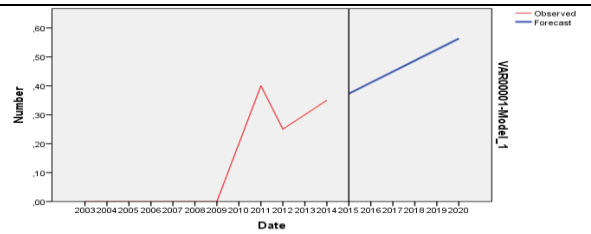

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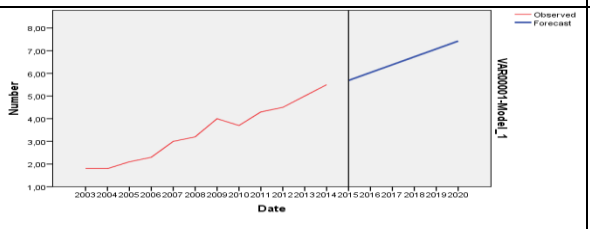

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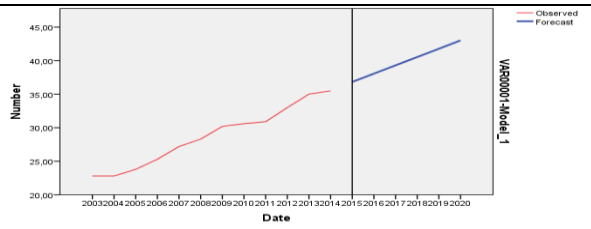

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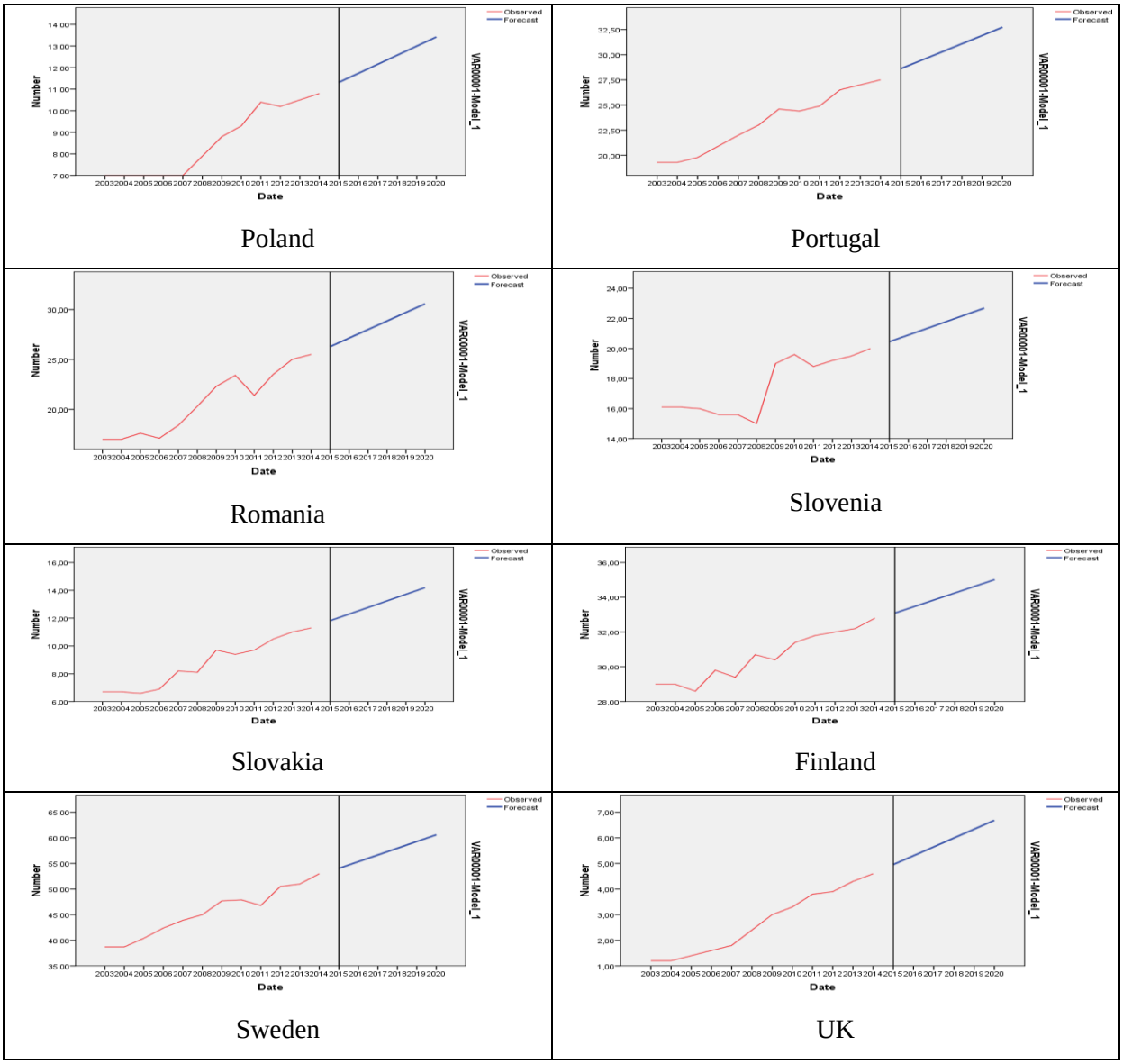
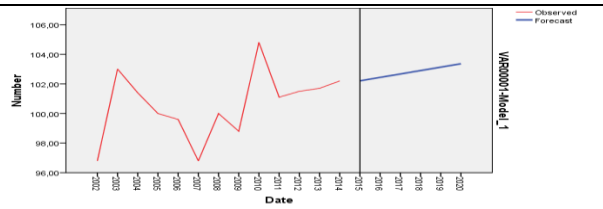


Figure 10. Share of renewable energy forecast

Source: personal contribution using SSPS19

An interesting observation can be made using Figure 10: 26 Member States (92.86%) will not change their cluster adhering as in 2014. In 2020, 6 states will face to renewable energy rates less than 10%, 11 states with rates between 10% and 20% and other 11 states will achieve rates greater than 20%.

The Europe 2020 Strategy stipulates a decrease of the primary energy consumption of at least 20% in comparison with 2005 level. Under this target, the forecast for 2020 is presented in Figure 11.



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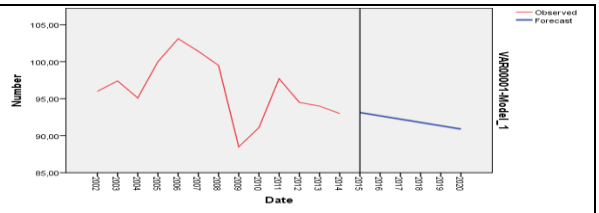

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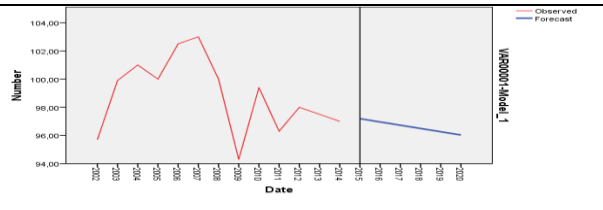

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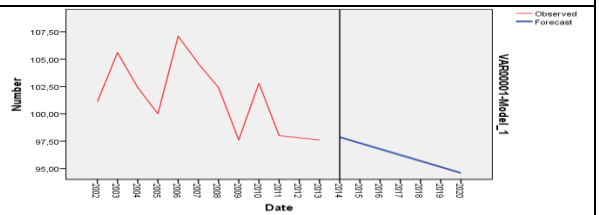

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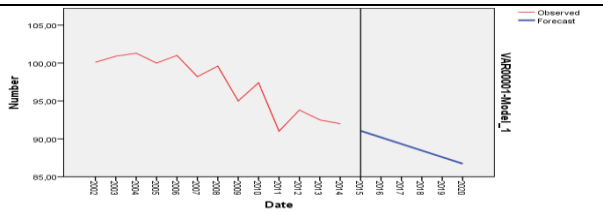

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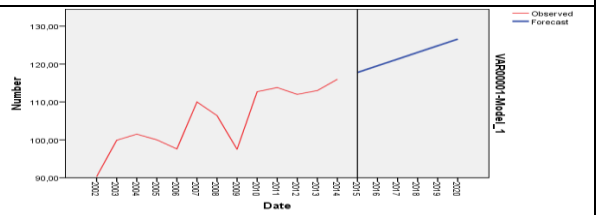

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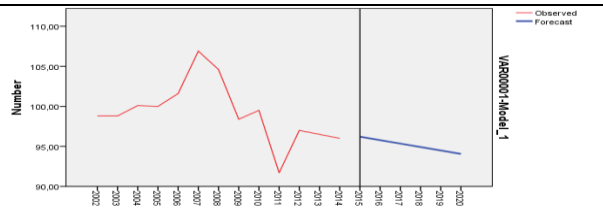

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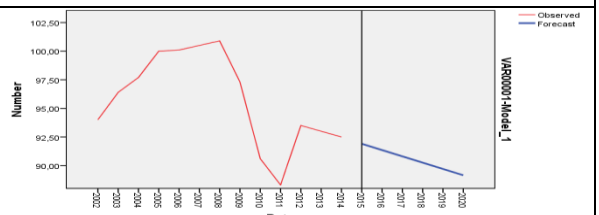

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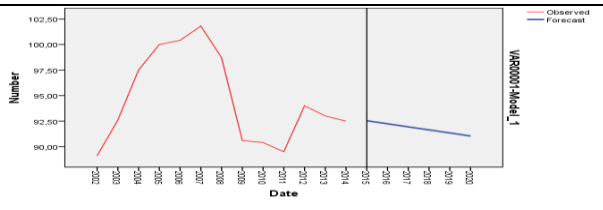

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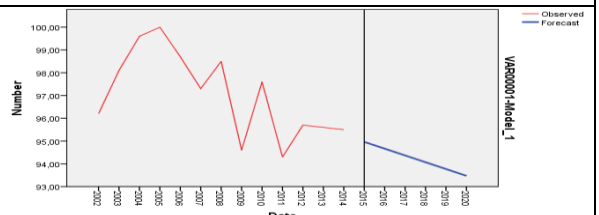

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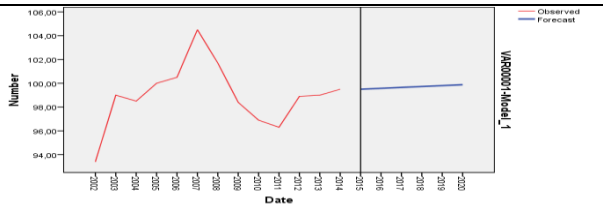

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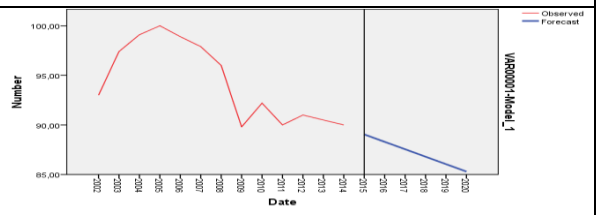

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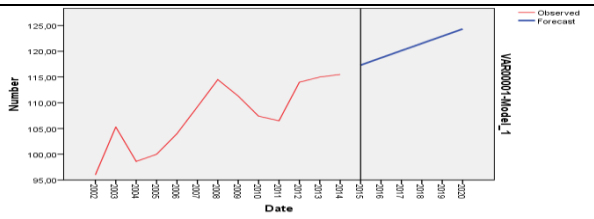

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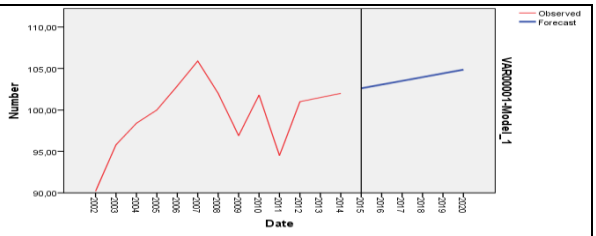

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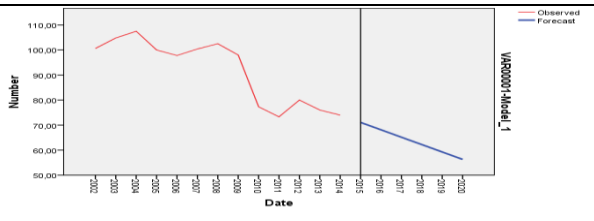

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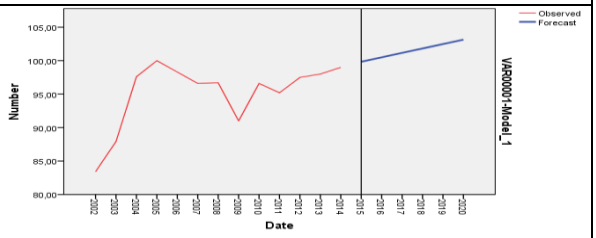

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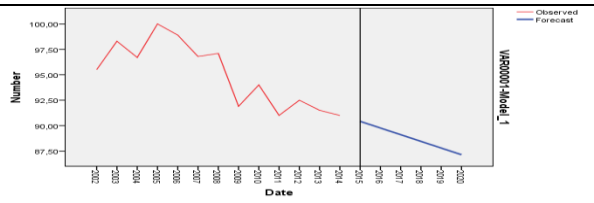

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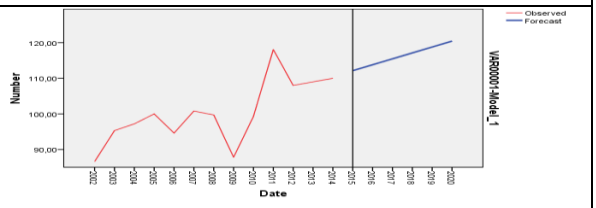

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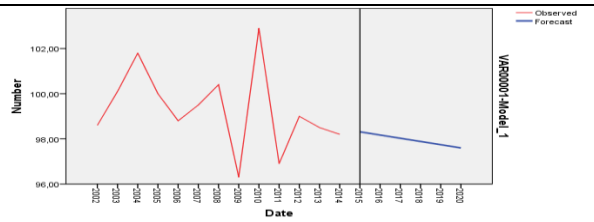

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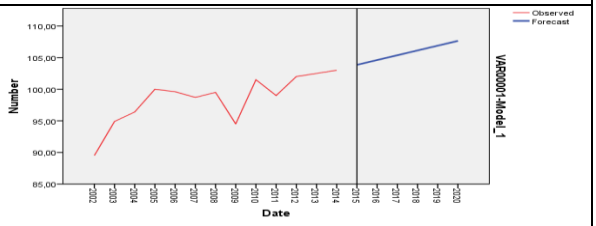

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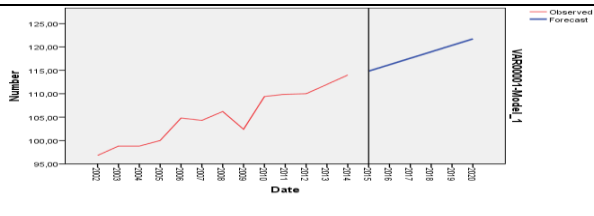

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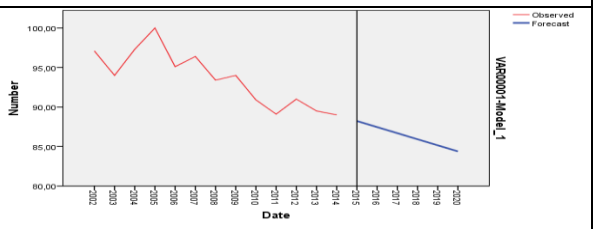

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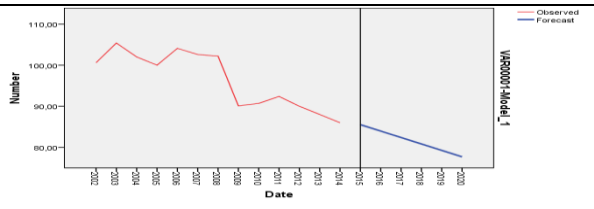

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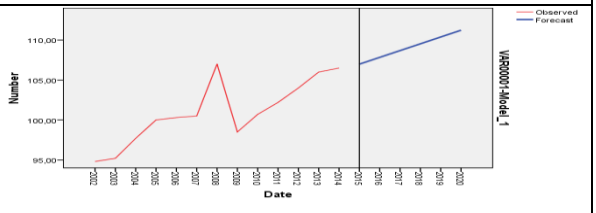

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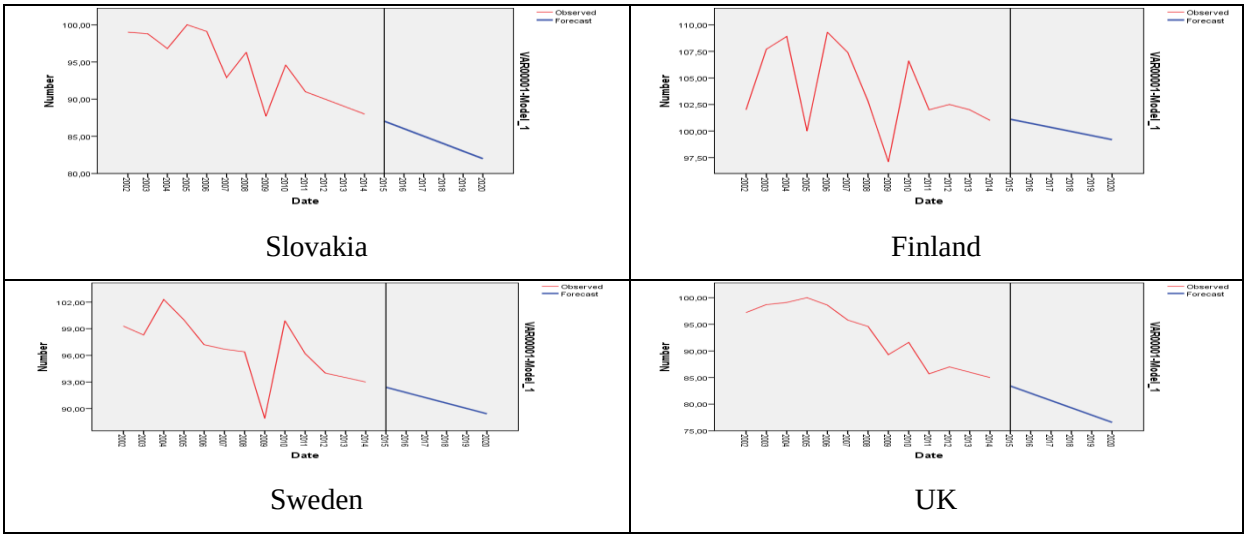
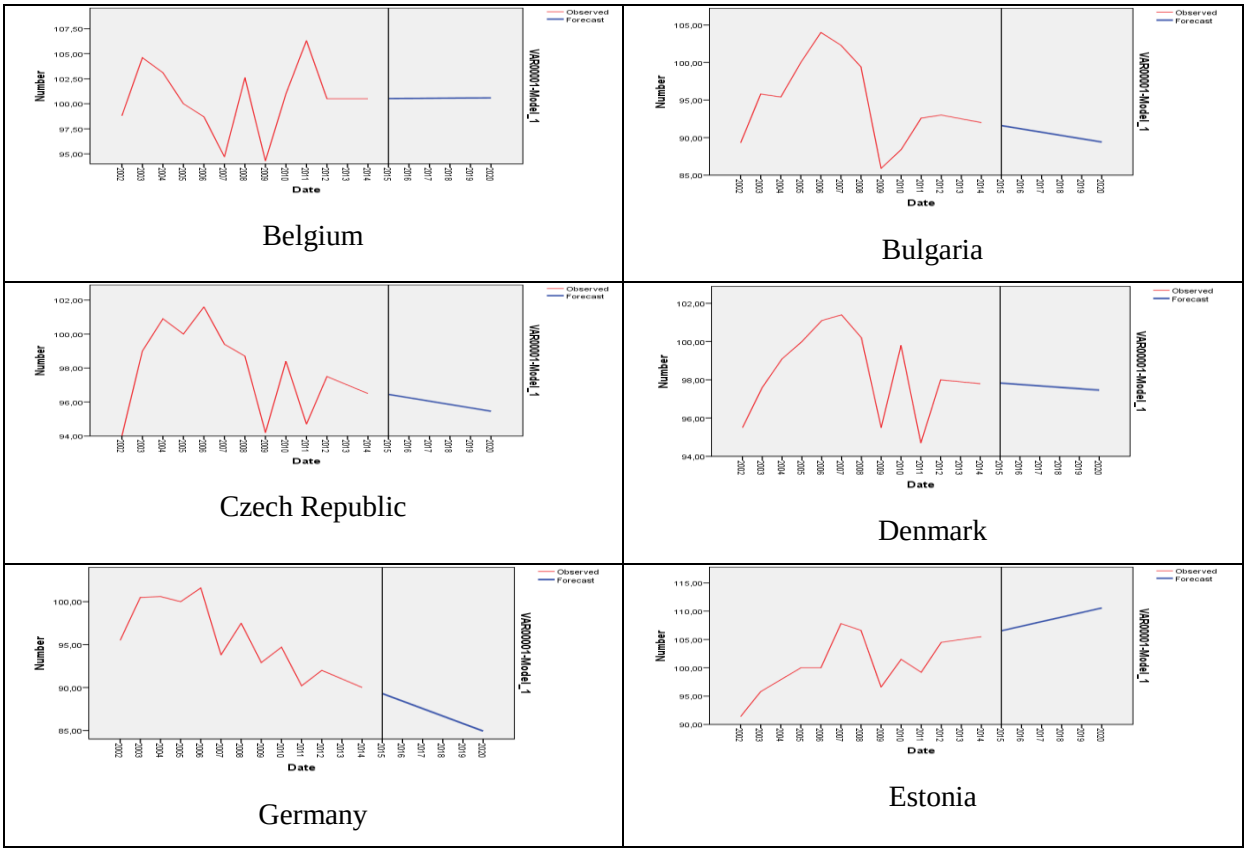


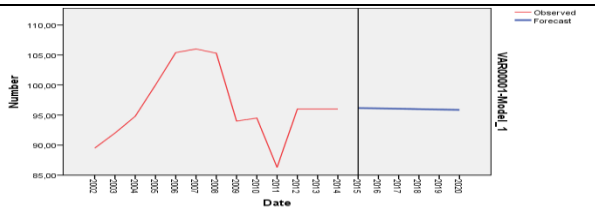
Figure 11. Primary energy consumption forecast (2005=100%)

Source: personal contribution using SSPS19

In 2020, 3 Member States will achieve primary energy consumption rates less than 80% (2005 =100%), 16 states rates between 80% and 100% and 9 states rates greater than 100%. Moreover, 23 states (82.1%) will maintain their adhering to the same clusters as in 2014.

The last analysed environment indicator is final energy consumption (index 2005=100%). It would decrease by 20% until 2020. The future level of this indicator in the Member States is presented in Figure12.





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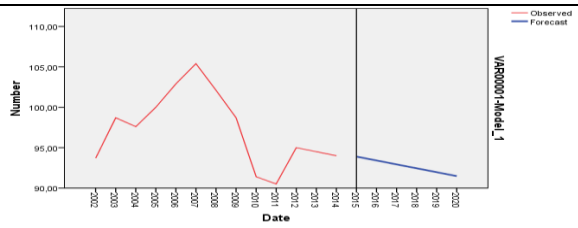

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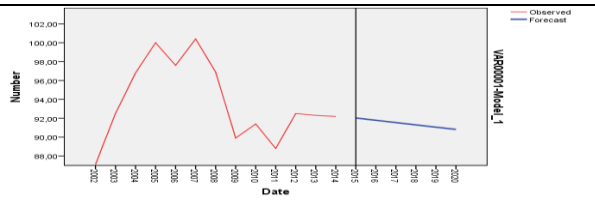

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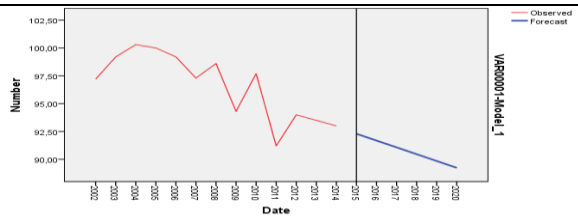

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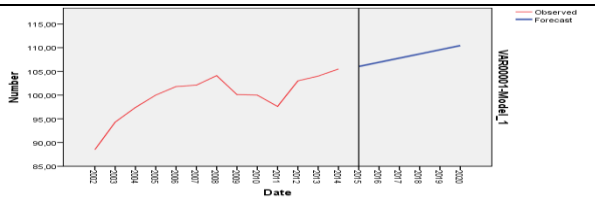

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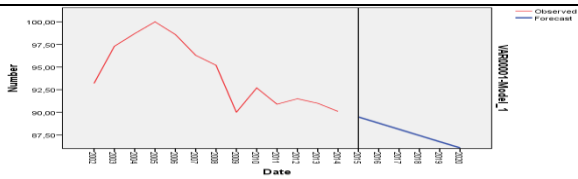

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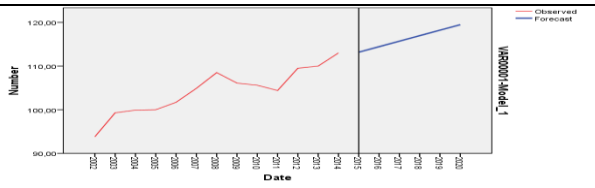

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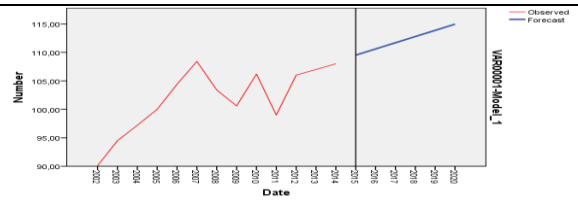

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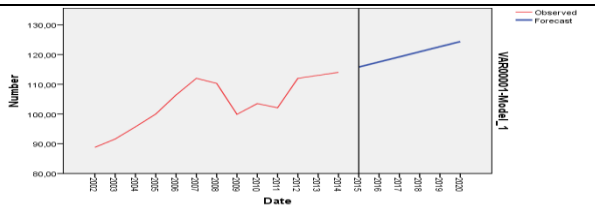

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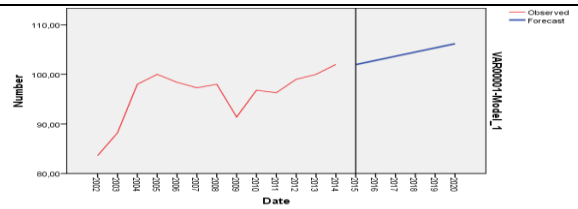

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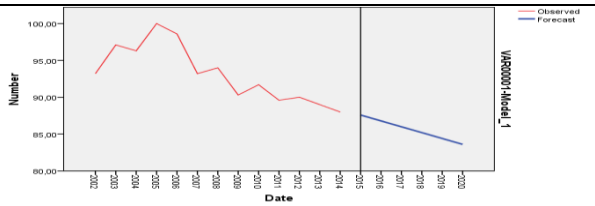

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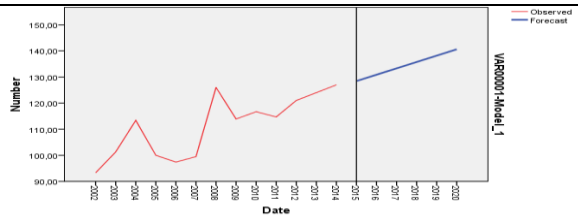

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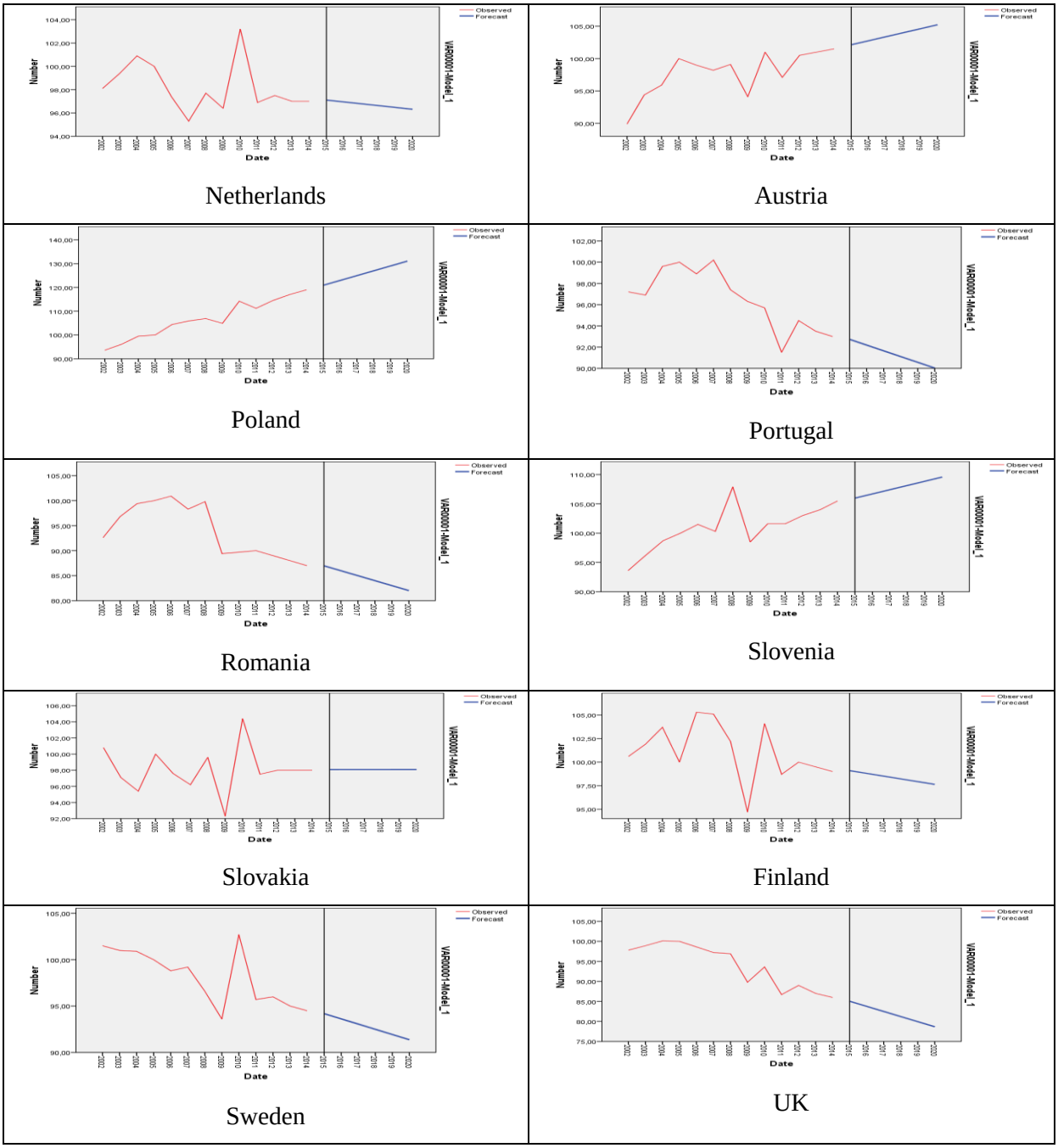

Figure 12 Final energy consumption forecast (2005=100%)

Source: personal contribution using SSPS19

The final energy consumption trend will improve in 2020, when 7 states will achieve rates less than 90%, 10 states between 90% and 100% and 11 states will face to rates greater than 100%. 24 Member States (85.7%) will maintain their positions into the clusters as in 2014.

5. Conclusions

Europe 2020 Strategy is focused on high four goals connected to the environment protection. The analysis of these goals (indicators) presented great disparities between the Member States which led to the conclusion that it is possible to form three clusters in 2014.

Unfortunately, the forecasts for 2020 are not positive and the cluster grouping will be maintained as in 2014. Moreover, many Member States will be not able to achieve the goals of the new Strategy.

This fact will be a new argue that EU 28 is not able to decrease the economic and environment regional disparities. The future is not so good and a new more realistic approach of the European challenges is necessary.

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