SUMMARY

The gas industry is characterised by production process that meets customer's current needs. Producing gas to store for the future demand is economically not feasible. This is mainly due to a high price of the gas tanks and cylinders. Despite to that customers have a high expectation on accessibility of the product and stabile deliveries. Gas market is characterized by consumer's dependence of the product. This means that delay on delivery will cause customers dissatisfaction. Ensuring the high delivery precision is essential to stay in the competition.

The efficiency indicator for planning and forecasting is delivery precision. This can be measured through evaluating on time deliveries and shortages. To get a good overview of delivery precision a weekly shortages report was conducted weekly in AGA. According to that report delivery precision unit was not meeting the set goal of 98% in Sweden. Shortage analyse causes also referred on inefficient planning. Two main causes were planning error and empty cylinders not available. Authors assessment is that efficient organisation of forecasting process would increase delivery precision reaching the goals set and even exceeding them.

The aim of this master's thesis was to work out the model for gas sector that characterises demand forecasting process. Authors model contains all the steps and their explanations. As a main research question author focuses on processing the data, time series forecasting methods and summary statistics for evaluating the forecasting error.

To conduct the analyse author chose products that belonged to A group according to ABC analyse and had an annual shortage over 10%. Twenty materials out of all met that criteria. Author mapped the sales of these products in a period 01.10.2015-30.09.2017. To forecast he demand author decided to used time series forecasting methods: moving average (two and four months), simple exponential smoothing, Holt's method and Holt-Winters method for additive and multiplicative seasonality. To rate the forecast accuracy summary statistics: mean absolute percentage error (MAPE), mean absolute deviation (MAD), mean square error (MSE) and root mean square error (RMSE) were used. Based on these statistics author evaluated all the forecasting methods and their suitability for forecasting to every material.

The research showed that Holt's method is giving good forecasting results for 80% of the materials; simple exponential smoothing for 30% of the materials and Holt-Winters Additive seasonality for 15%

of materials. 25% of the materials give similar forecasting accuracy when using simple exponential smoothing and when using Holt's method. For those materials, it is recommended to use simple exponential smoothing. Authors research shows that there is not one method suitable for forecasting all the products, but that each material needs an individual approach. Based on the research conducted author set a forecasting model recommended for AGA and other similar gas companies.

In conclusion, it can be said that this case study met its target offering a solution for the research problem set. The research conducted within this thesis benefits most for AGA, but could be used widely in whole gas industry. This thesis should mostly interest companies, who wish to introduce optimal way for demand forecasting. The instructions given in this thesis are also suitable for companies that have no previous experience with demand forecasting as it coverers the main steps like: data preparation, forecasting methods and error evaluation. The most important result is the forecasting process model. This gives a list of demand forecasting steps with description.