

## SUMMARY

The main aspects of making green production plant is to be able to abide by the following rules:

- reduce pollution from the production;
- find sustainable energy sources.

In this thesis the main focus has been on trying to explain and promote technologies of capturing carbon dioxide from different types of plants and directly from the air, as well as suggest some renewable energy sources to reduce the atmosphere pollution, because as everyone could notice at the moment, drastic environmental catastrophes are happening right in front of our eyes - such as constant floods, storms and other events, that have been the result of greenhouse effect.

For the part of catching CO<sub>2</sub> the methods of Carbon Capture and Storage, Direct Air Capture and reforestation methods, as well as more modern developments into hydrogen production have been reviewed. These approaches are currently in development and require a lot of work to become efficient solutions to the problems. Two main issues that scientists are trying to solve are -

- The methods are at the moment are very expensive,
- The mechanisms in general require a lot of power to work, which in turn can negate the positive impact it has on the environment, if this energy comes not from a renewable source.

The sustainable energy sources are highly dependent on the place that the mini-plant is located, as the wind, solar, hydro and geothermal power potential is calculated based on the landscape and/or different weather conditions.

Therefore, to plan a successful small-scaled green production mini-plant, it is crucial to take into consideration the factors, advantages and disadvantages of the methods discussed in this work.

Currently Estonia receives more than 90% of its energy from the shale oil industry, and it is not possible to meet a source demand if that method is completely

abandoned. However, it is possible to reduce the negative effect on the environment. It can be estimated that the most suitable way for capturing and processing carbon dioxide would be hydrogen production with electrolysis method of separation. With a large amount of shale oil production, the partial oxidation method should be used together with pressure-swing absorption.