NOAH

Interreg Baltic Sea Region

EUROPEAN UNION

EUROPEAN REGIONAL DEVELOPMENT FUND

REPORT ON ACTIVITY 2.2:

Climate scenarios selection

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1. Introduction

The climate change is happening today and already has an impact on nature and human society. However probably the most wide-ranging consequences will be in the future. But many factors affecting climate change are deeply uncertain and will be shaped by peopleҁs actions. That is why climate scenarios allow to explore possible futures, the assumptions they depend upon, and the courses of action that could bring them about.

Climate change is not happening in isolation, but in concert with other processes of environmental, social, technical, economic, and cultural change. Scenario types have emerged that embed climate change in this broader context of change. Climate-resilient development pathways generalize the concept of adaptation pathways and focus on patterns of future development that make societies more resilient to climate change. Sustainable development pathways are goal-oriented pathways towards achieving a broad set of sustainable development goals.

Climate change and socioeconomic development are deeply intertwined. Social and economic activities are the main driver of climate change. In turn, climate change will have serious impacts on these activities, e.g., by rising sea levels and exposure to severe weather events (Fig. 1).

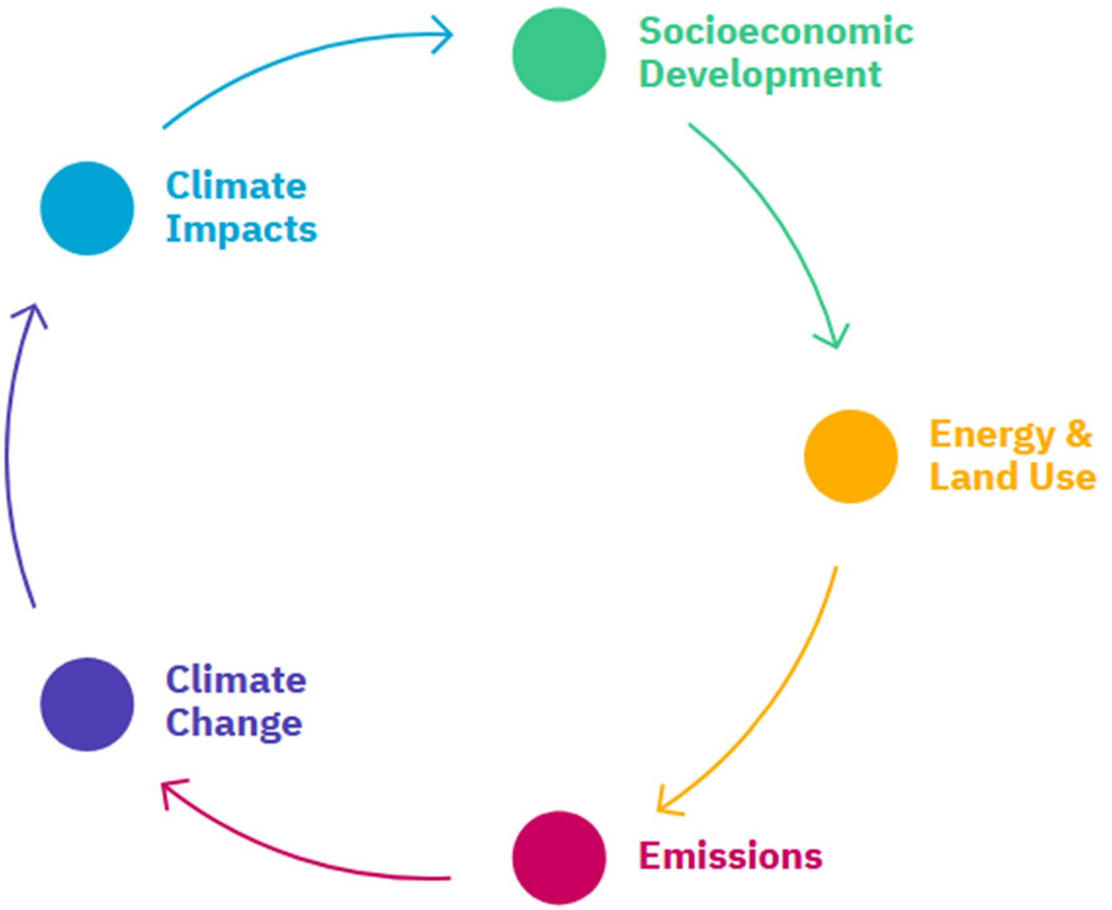

Fig. 1. Correlation between climate change and socioeconomic development

Climate impacts will, and already did, influence social and economic activity. Socioeconomic damages emerge not only from the direct impact on physical infrastructure, human productivity, natural resources, and ecosystem services. They also emerge from indirect impacts such as disruptions of globally connected supply chains, deteriorating institutions and climate impact induced migration. Importantly, direct and indirect damages are not only a function of future climate change and adaptation measures, but also depend on assumptions about broader socioeconomic developments.

1.1. Climate change scenarios

Climate change scenarios are no exception. They are not predictions of the future, but rather projections of what can happen by creating plausible, coherent and internally consistent descriptions of possible climate change futures. They can also constitute plausible, coherent and internally consistent descriptions of pathways towards certain goals.

Integrated assessment models are an important tool to analyze a response to climate change. Since they capture the link between socioeconomic developments, energy and land use, and emissions, they can be used to investigate emissions reductions strategies to stay below a certain warming limit **(mitigation pathways)**. Likewise, biophysical and economic impact models can be used to study adaptation measures to limit the impact of climate change on socioeconomic activities **(adaptation pathways)**.

1.2. Mitigation of climate changes

The Paris Agreement was a historic step in global efforts to combat climate change. Countries agreed to take action to hold global mean temperature increase well below 2°C and pursue efforts to limit warming to 1.5°C.

The first climate change scenarios was A2, A1B and B1. A2 scenario assumed that it will be significant population growth, slow economic development and slow technological change. A1B scenario assumed rapid economic growth and introduction of more efficient technologies combined with the sustainable use of energy sources. Finally, B1 scenario assumed the same population growth as in the A1B scenario, however took into account faster changes in economic structure focused on the dominance of services and information technologies. Fig. 2 presents the temperature changes according to mention above scenarios.

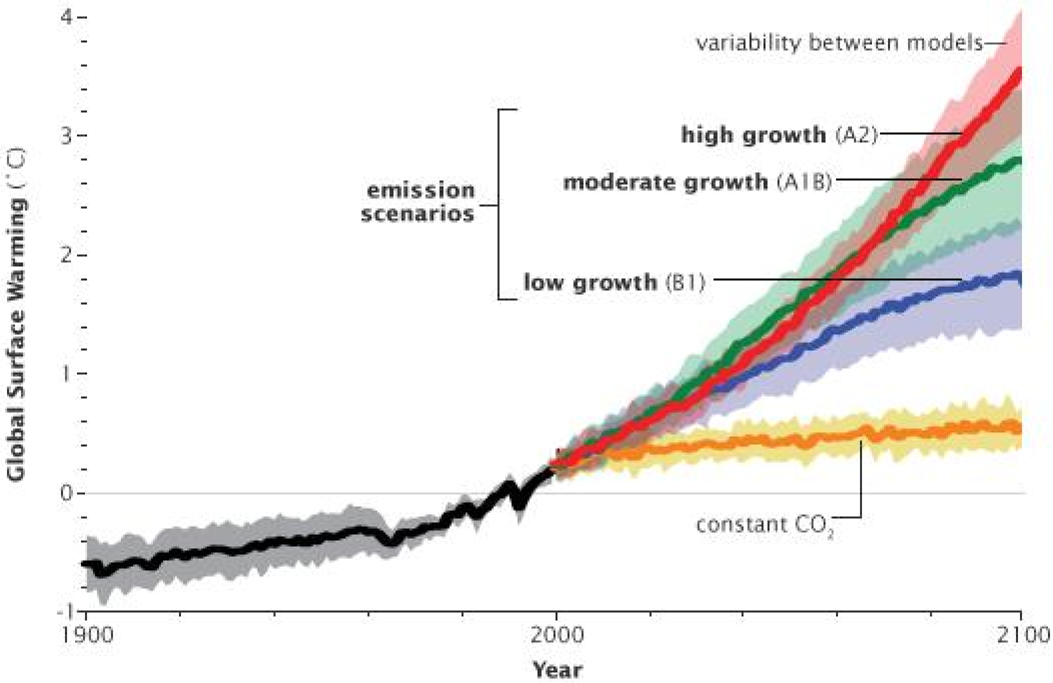

Fig. 2. The temperature changes according to A2, A1B and B1 scenarios.

For classifying the stringency of different warming limits the concept of Representative Concentration Pathways (RCPs) has been also introduced to climate change research. They originally comprised four projections, ranging from RCP 2.6 to RCP 8.5. However after the adoption of the Paris Agreement they were augmented by RCP 1.9 to represent mitigation pathways compatible with the 1.5 °C warming limit. The expected radiative forcing levels and required reduction of emission is presented in Table 1.

Table 1. The expected radiative forcing levels and required reduction of emission

RCP	Forcing	Temperature	Emission Trend
1.9	1.9 W/m^2	~1.5 °C	Very Strongly Declining Emissions
2.6	2.6 W/m^2	~2.0 °C	Strongly Declining Emissions
4.5	4.5 W/m^2	~2.4 °C	Slowly Declining Emissions
6.0	6.0 W/m^2	~2.8 °C	Stabilising Emissions
8.5	8.5 W/m^2	~4.3 °C	Rising Emissions

It is expected that doubling of atmospheric CO_2 concentration from preindustrial times, i.e. from ca. 280 ppm to 560 ppm, would amount to a radiative forcing of 3.7 Watt/m^2. In 2016, CO_2 concentrations reached 400 ppm, and the radiative forcing from all anthropogenic influences on the climate system was estimated to amount to ca. 2.3±1 Watt/m^2 in 2011.

1.3. Socioeconomic scenarios in climate change

Due to interaction between socioeconomic development and climate change to scenarios mentioned above socioeconomic factors have been added. They are called as the Shared Socio-Economic Pathways (SSPs) (Fig. 3).

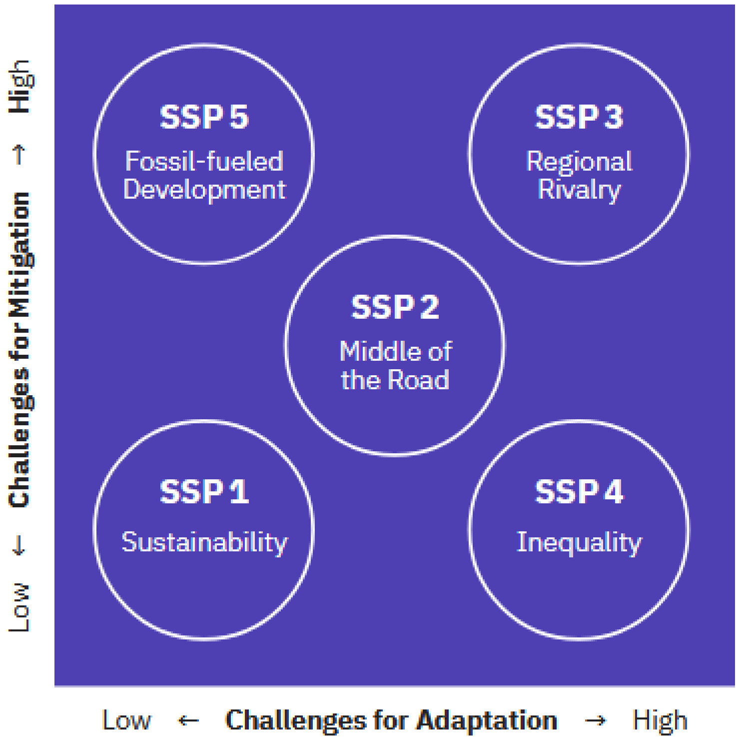

Fig. 3. Socioeconomic scenarios in climate change

Socioeconomic scenarios in climate change:

- **SSP1: Sustainability** (Taking the green road)
  This scenario assumes the low challenges to mitigation and low challenges to adaptation; itsassumptions:(i) global population peaks mid-century, (ii) emphasis on human well-being, (iii) environmentally friendly technologies and renewable energy, (iv) strong and flexible institutions on global, regional, and national level.
- **SSP2: Middle of the road**
  This scenario assumes moderate challenges to mitigation and moderate challenges to adaptation; its assumptions: (i) population growth stabilizes toward the end of the century, (ii) current social, economic, and technological trends continue, (iii) global and national institutions make slow progress toward achieving sustainable development goals.

- **SSP3: Regional rivalry** (A rocky road)

  This scenario assumes high challenges to mitigation and high challenges to adaptation; its assumptions: (i) population growth continues with high growth in developing countries, (ii) emphasis on national issues due to regional conflicts and nationalism, (iii) economic development is slow and fossil fuel dependent, (iv) weak global institutions and little international trade

- **SSP4: Inequality** (A road divided)

  This scenario assumes low challenges to mitigation and high challenges to adaptation; its assumptions: (i) population growth stabilizes toward the end of the century, (ii) growing divide between globally-connected, well-educated society and fragmented lower income societies, (iii) unrest and conflict becomes more common, (iv) global, regional, and national institutions are ineffective

- **SSP5: Fossil-fueled development (Taking the highway)**

  This scenario assumes high challenges to mitigation and low challenges to adaptation; its assumptions: (i) global population peaks mid-century, (ii) emphasis on economic growth and technological progress, (iii) global adoption of resource and energy intensive lifestyles, (iv) lack of environmental awareness.

1.4. Correlations between SSPs and RCPs scenarios.

The mitigation pathway developed by the application of integrated assessment modelling comprises a wide variety of mitigation pathways, including pathways with limited technology availability and delays in climate policy in addition to variations in mitigation targets and socioeconomic drivers.

Fig. 4-8 show the energy demand and CO_2 emissions developments for the various combinations of SSPs and RCPs.

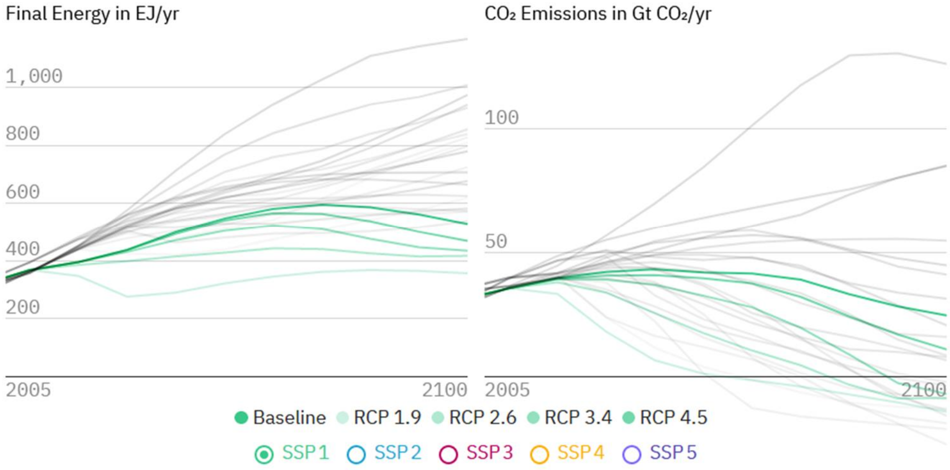

Fig. 4. The energy demand and CO_2 emissions for SSP1

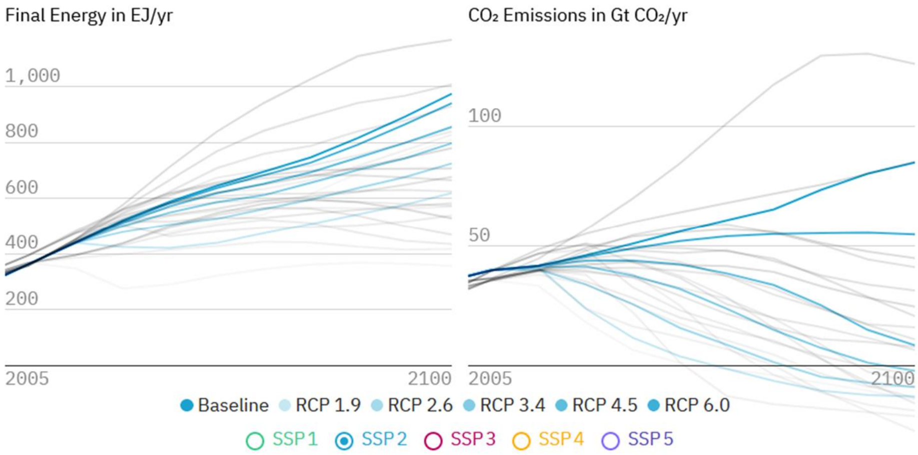

Fig. 5. The energy demand and CO_2 emissions for SSP2

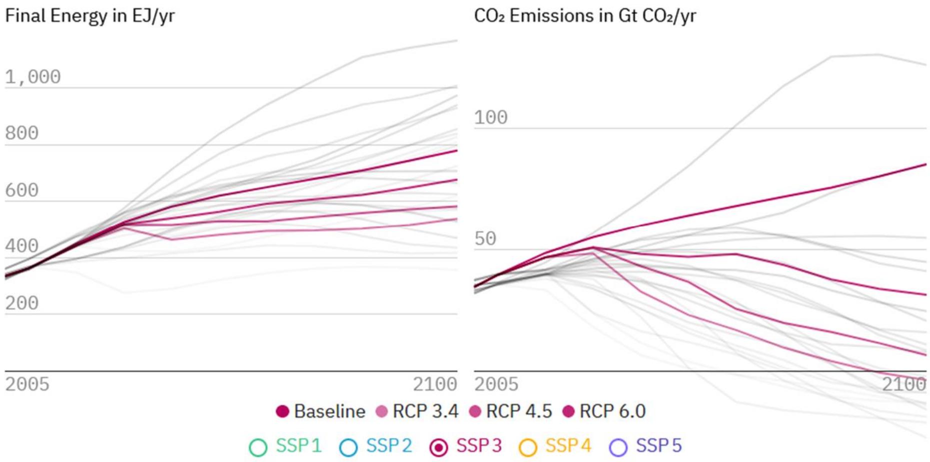

Fig. 6. The energy demand and CO_2 emissions for SSP3

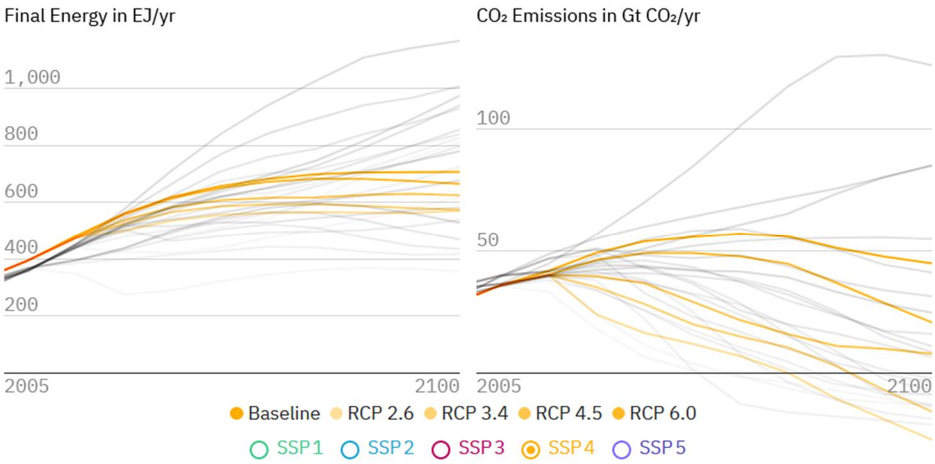

Fig. 7. The energy demand and CO_2 emissions for SSP4

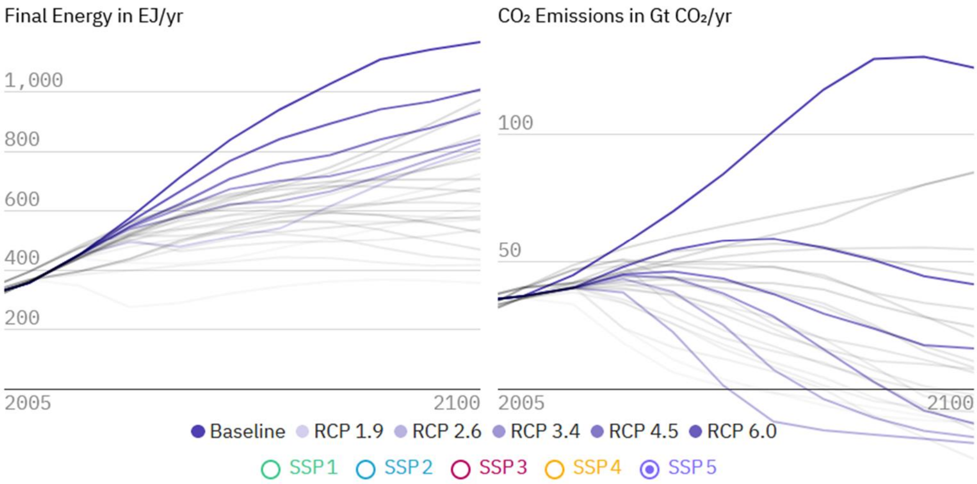

Fig. 8. The energy demand and CO_2 emissions for SSP5

All scenarios assume a large range of greenhouse gas (GHG) emissions into the atmosphere. The greenhouse effect denotes the absorption and reemission of heat radiation from the Earth surface by GHGs in the atmosphere.

Fig. 9 shows the warming in near surface temperatures from 2006ï 2010 to 2095ï 2099 for two different emissions scenarios: RCP 2.6 and RCP 6.0. According to these scenarios the overall temperature is going to rise, and the increase is far more severe in RCP 6.0. It can also be seen that the warming varies between regions, with highest warming occurring in the Northern latitudes.

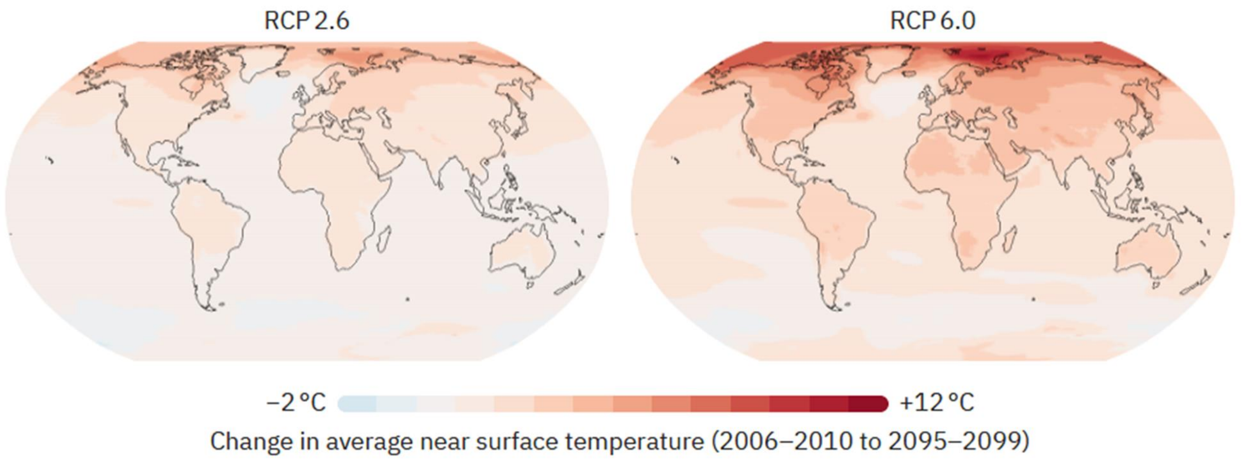

Fig. 9. The warming in near surface temperatures from 2006ï 2010 to 2095ï 2099 for RCP 2.6 and RCP 6.0 scenarios

Climate impacts are consequences and effects of climate change on nature and society. These may include changed agricultural yields, increased floods, and droughts, or coral reef bleaching due to changes in the chemical composition of the ocean.

References

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2. Partnerôs recommendations for climate change scenario selection

The selection of an appropriate climate change scenarios which was relevant for realization one of the significant NOAH Projectôs task was based on government strategies or local government projects as well as IPCC recommendations. Short descriptions for each partner country are presented below, whereas relevant documents are annexed to the report (Appendix 1÷ 6).

2.1. DANMARK

The Danish recommendations for how to use the IPCC AR5 reportôs RCP scenarios are being updated in 2019. The Danish Meteorological Institute is responsible for this process. The new guidelines are called the Climate Atlas (Danish: ñKlimaatlasò), which will contain detailed maps of future changes to temperature, precipitation, wind, etc.

Currently there are only overall advice for how to use the RCP scenarios for large infrastructure investments. The choice of scenario depends on the planning horizon of the project and the level of robustness that is deemed necessary for the design, as shown in the following diagram:

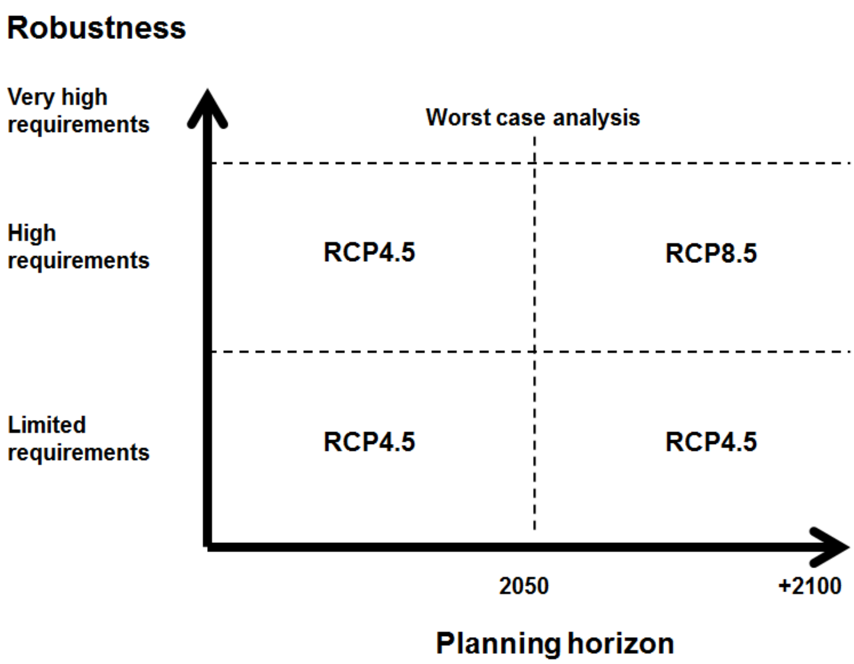

Fig. 10. Recommended scenarios depending on planning horizon and requirements to robustness of design

However, it can be assumed that two RCP climate scenarios might be considered: RCP 4.5 and RCP 8.5, as the basis for building the NOAH model.

References:

Appendix 1: Danish Meteorological Institute:
https://www.dmi.dk/fileadmin/user_upload/Bruger_upload/Raadgivning/Vejledning_i_anvendelse_af_udledningsscenarier.pdf

The Environmental Protection Agency in Denmark also maintains a website with advice on and inspiration for climate change adaptation projects:
https://en.klimatilpasning.dk/

2.2. ESTONIA

The Estonian development plan for climate change adaptation was started in 2013 and the draft plan together with the implementation plan was completed in spring 2016, which resulted finally in ñDevelopment Plan for Climate Change Adaptation until 2030ò. The development plan was prepared based on comprehensive studies and analyses. These studies and analyses determined the impact of climate change on priority areas (i.e.: health and rescue capability; land use and planning; natural environment; bioeconomy; economy; society, awareness and cooperation; infrastructure and buildings; energy and security of supply) and the adaptation measures which need to be taken in the short term until 2030 and which are a part of a long-term vision until the year 2100. The main objective of the development plan was to increase the readiness and capacity of the state, the regional and local level to adapt to the effects of climate change.

According to Estonian ñFuture Climate Scenarios until 2100ò it was suggested to take into account two main scenarios for the climate change adaption plan. First one is RCP4.5 (main scenario, moderate), which assumes that countries will implement mitigation actions. On the other hand, additional scenario is considered ï RCP8.5 (pessimistic scenario), that predicts weak cooperation between countries with mainly carbon-based economy.

Although climate change in Estonia is not as extreme as in many other countries of the world and the European Union, it can be expected that the following changes will be observed:

- ***rise in temperature*** and the related reduction in ice and snow cover (also: heatwaves and droughts; changes in vegetation; spread of alien species)

Table. 2. RCP 4.5 & 8.5 ï temperature rise compared to 1971-2000 (°C)

Period	2041-2070		2071-2100	
Scenario	RCP4.5	RCP8.5	RCP4.5	RCP8.5
Winter (DJV)	2.3	2.9	3.1	4.9
Spring (MAM)	2.4	3.1	3.4	4.9
Summer (JJA)	1.6	2.2	2.2	3.8
Autumn (SON)	1.7	2.2	2.2	3.6
Yearly average	**2.0**	**2.6**	**2.7**	**4.3**

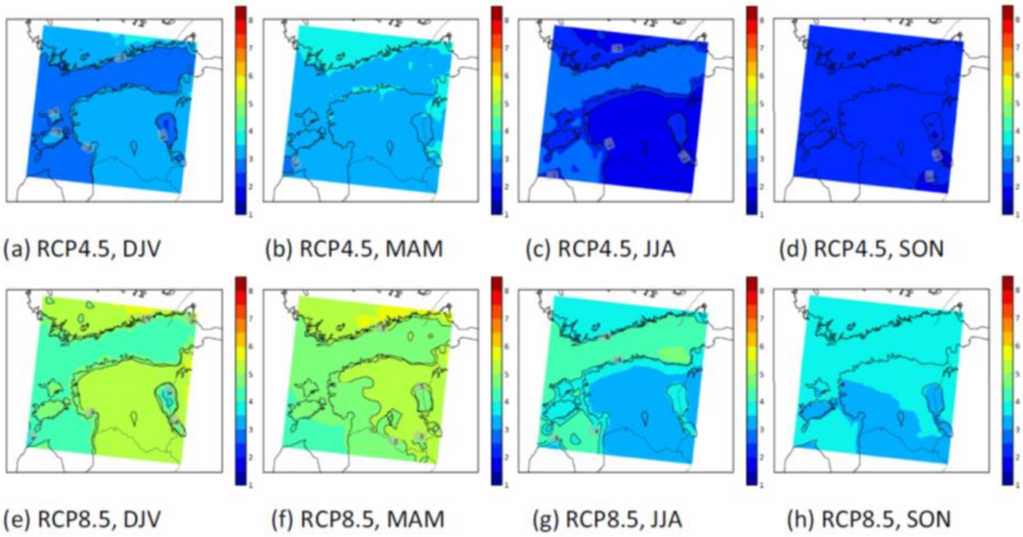

Fig.11. RCP 4.5 & 8.5 ï temperature rise in 2071-2100 compared to 1971-2000 (°C)

- ***increase in the amount of precipitation***, especially in winter periods and the related floods;

Table 3. RCP 4.5 & 8.5 ï relative precipitation rise compared to 1971-2000 (%)

Period	2041-2070		2071-2100	
Scenario	RCP4.5	RCP8.5	RCP4.5	RCP8.5
Winter (DJV)	9	15	16	22
Spring (MAM)	10	16	21	24
Summer (JJA)	11	18	15	19
Autumn (SON)	10	8	11	12
Yearly average	**10**	**14**	**16**	**19**

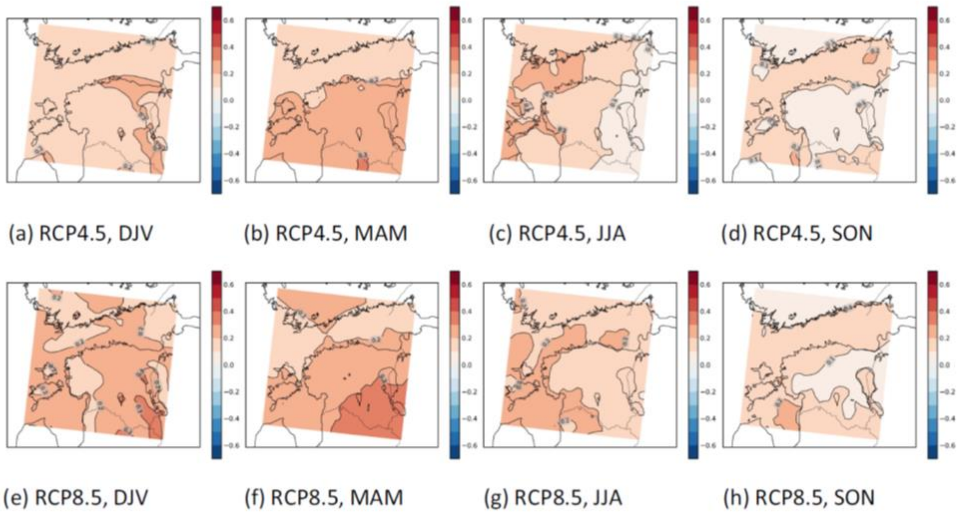

Fig.12. RCP 4.5 & 8.5 ï relative precipitation rise in 2071-2100 compared to 1971-2000 (%)

- ***rise in sea level*** and the related shore erosion, risk on coastal facilities, pressure for relocating buildings, etc.;

- ***increase in the number of storms*** and the related requirements for the durability of the infrastructure and the buildings as well as for the capability of eliminating the effects of the storm.

References:

Climate Change Adaptation Development Plan until 2030 ***(Appendix 2)***

Future climate scenarios until 2100; Estonian Environmental Agency:
https://www.envir.ee/sites/default/files/kliimastsenaariumid_kaur_aruanne_ver190815.pdf

2.3. FINLAND

The latest estimates of the future climate scenarios for Finland are based on calculations made by 28 global climate models. Which scenario is the most relevant depends on the global emissions of greenhouse gases. Therefore the most recent RCP scenarios are considered (RCP 8.5, RCP 6.0, RCP 4.5 and RCP 2.6).

The new model results seem to warm up the summer in Finland somewhat more than previously estimated, but instead the changes in rainfall have not changed much from the previous ones. According to the calculations, the climate seems to change more in the winter than in the summer. As a result, the following changes are expected to occur in Finlandôs climate:

Å temperature will rise,

Å precipitation will increase,

Å storm winds will change,

Å snow cover and soil frost will reduce,

Å cloud cover will increase and sunshine will decrease,

Å sea level in the Baltic Sea will rise and the winter ice cover will reduce.

Temperature and rainfall will increase much higher in winter than summer months that is related to time of year/season and regional conditions. In winter, temperature will rise quicker in Northern Finland than Southern, whereas in summer there will be no major differences. Generally, all scenarios indicate that temperature will increase more in Finland than globally. At best, efficient limitations in pollution (according to RCP 2.6 scenario assumptions) will lead to the average temperature rise of 2ºC. The less efficient pollution reductions (RCP 4.5, RCP 6.0) will result in temperatures higher of 3-4ºC. If the worst case scenario RCP 8.5 happens than temperature will rise by 6°C /100 years. Taking into account precipitation, increase in rainfall may range from 20% (for the worst RCP 8.5 scenario) to 8% (for RCP 2.6). Additionally, rainfall will be higher in summer, especially in Northern Finland.

Scenarios to local level: Pori

In Finland there are a total of 21 flood risk areas where the risks caused by flooding of watercourses or the sea are to be considered significant. Of these 17 areas are located along inland watercourses and four on the sea coast. The Ministry of Agriculture and Forestry designated certain areas as significant flood risk areas in December 2011. It is estimated that the greatest risks associated with the flooding of watercourses are in Rovaniemi and Pori, while the risks due to rise in the sea level are the greatest in the capital area and Turku region. Factors taken into account in assessing the significance of the risks are the likelihood of the risk and possible damage caused. Flood maps drawn up for the significant flood risk areas show the area that may be covered with water and the kind of damage it may cause. It is assumed that:

Å the highest precipitations will occur in the future in the summer;

Å the heaviest rains will probably occur also in the future in the summer and in the early autumn;

Å the heaviest rains (i.e. local thunderstorms) in the summertime may increase by 10÷25 %;

Å six hour rainfalls (their precipitation) may increase somewhat more, approximately 10÷40 %.

It must be also noticed that changes in very short lasting (e.g. 15 minutes) heavy rains cannot be determined reliably.

References:

The Climate Guide Service: https://ilmasto-opas.fi/en/ilmastonmuutos/suomen-muuttuva-ilmasto/-/artikkeli/74b167fc-384b-44ae-84aa-c585ec218b41/ennustettu-ilmastonmuutos-suomessa.html

Appendix 3: Climate Projections for Finland Under the RCP Forcing Scenarios

2.4. LATVIA

Analysis of recent climate and future climate change scenarios for Latvia shows graphic climate change tendencies. For the future time periods (2011-2040, 2041-2070 and 2071-2100) the climate variable changes are projected in accordance with two greenhouse gas (GHG) emission scenarios ï RCP 4.5 and RCP 8.5. Most significant changes are related to extreme values of climate variables, indicating that in the future Latvia will more often face weather conditions uncharacteristic and extreme for its territory. Therefore, in order to prevent risks related to climate change and their possible consequences, it is essential to develop and introduce research result-based adaptation actions in all economy industries.

Projected changes that refer to main components of Latvian climate (temperature, precipitation and wind) will be respectively discussed below.

Air temperature

According to the RCP scenarios, it is expected that by the end of the century the annual-mean air temperature will increase by an average of 3.5ºC in RCP 4.5 scenario and by 5.5ºC in RCP 8.5 scenario. Although spatially the average air temperature rise in Latvia will be relatively even, the most pronounced changes are expected in the Eastern regions. However, by 2100 the most significant increase will be observed in the minimum air temperature values. If the annual-mean minimum air temperature rises similarly to the mean and maximum air temperature values, i.e. by 3.6ºC to 5.6ºC, then the annual minimum air temperature will increase by an average of 9.3ºC to 13.5ºC.

Furthermore, it is expected that by 2100 the increase of air temperatures will affect the duration of the growing season ï the scenarios project an extension of the growing season by 27 to 49 days, or by about 1 to 2 months.

Precipitation

By the end of the century, an increase of the total annual precipitation by 13 to 16% (about 80-100 mm) according to RCP 4.5 and RCP 8.5 scenarios respectively is projected. Seasonally, the most significant increase in the amount of precipitation is expected during the winter and spring seasons. In general, both scenarios project an increase of precipitation in all future periods of time and seasons, with the exception of the summer seasons of 2071-2100, during which, according to the RCP 8.5 scenario, the amount of precipitation in some locations may decrease. However, these projections are uncertain.

The scenarios project also an increase of the intensity of precipitation ï by about 0.1-1 mm/day according to the RCP 4.5 scenario, and by 0.5 to 1.3 mm/day according to the RCP 8.5 scenario. The highest precipitation intensity increase is expected in the coastal area of the Baltic Sea and in Vidzeme.

Wind speed

In the future the most radical decrease of mean wind speed (4-13%) can be expected in a moderate climate change scenario while in the significant climate change scenario a decrease of 0-6% is projected. Climate model projections, however, show uncertainty, and in both scenario conditions some models project increase in mean wind speed too. Under the impact of further decrease in mean wind speed, most climate models project decrease in the number of calm days in Latvia on the average for 2-24 days in RCP 8.5 and RCP 4.5 scenarios, respectively. Meanwhile, only small changes in the mean number of stormy days are projected for Latvia.

References:

Appendix 4: Climate change scenarios for Latvia (Report Summary)
http://www2.meteo.lv/klimatariks/summary.pdf

https://www4.meteo.lv/klimatariks/?lang=EN

Latvian legislation: http://www.varam.gov.lv/lat/likumdosana/normativie_akti/?doc=3158

2.5. POLAND

National Adaptation to climate change policy: A1B Scenario

Polish national adaptation to climate change policy is a consequence of the implementation of the commitments to European Union in this area. In 2013, Polish Government accepted ñPolish National Adaptation Strategy to Climate Change (NAS 2020)ò (*Appendix 5.1*) . It was a strategic plan that covered period up to 2020 (with a perspective to year 2030) and indicated adaptation actions that had to be taken for sectors and areas vulnerable to climate change (i.e. water management, agriculture, industry, energy sector and spatial development). The vulnerability of these sectors was identified on the basis of climate change scenarios developed for NAS 2020.

This document assumed 3 climate scenarios defined respectively by the Intergovernmental Panel on Climate Change (IPCC) as emission scenario B1, A1B and A2**.** Scenarios of climate change in Poland were prepared using hydrodynamic models of climate system. Climate change scenarios for Polish regions and the simulations were prepared as the EU project ENSEMBLES. The results of eight regional models including the boundary conditions of the four global models (ARPEGE, ECHAM5, BCM, HadCM3Q0) have been used to assess climate change in Poland. Among mentioned scenarios, the A1B scenario was selected in accordance with recommendation not to apply excessively radical scenarios but rather rely on a moderate scheme.

According to the A1B scenarioôs simulations, following changes (especially at the end of 21st century) were considered:

- temperature increasing trend across the country (above 4.5°C of the range in winter and summer), reflected by all climatic factors based on this variable (i.e.: extending the growing season, decrease in the number of days with minimum temperature less than 0°C and increase in days with maximum temperature higher than 25°C),
- some increase in winter precipitation and reduction of summer precipitation (not entirely clear trend),
- temperature characteristics such as the number of days, reflect upward trend in temperature changes,
- the average annual level of Baltic Sea rise by 5 cm (between 2011-2030) and as an effect: intensification of storms and coastal erosion.

The results of A1B scenario forecasts analysis indicated that the greatest threat to the economy and society of Poland were supposed to have increase in the average annual air temperature and increase in frequency and intensity of extreme phenomena, i.e. droughts, strong winds, storms and instant floods. Mentioned results were part of the research project ñKLIMADAò, carried out in years 2011-2013. ñKLIMADAò project covered the period until 2070 and was the basis for the conclusions presented by the NAS 2020 project.

MPA Project ï Urban Adaption Plans: RCP Scenarios

Due to the fact that urban areas are most vulnerable to climate change, subsequent documents were created at the local government level (with the support of the Ministry of the Environment of Poland). Measurable effect of undertaken actions was development of project named ñUrban Adaptation Plansò (*MPA: Miejskie Plany Adaptacyjne*). MPA Project lasted from 2017 to 2019 and concerned 44 cities with more than 100,000 inhabitants (excluded Warsaw which was covered by ñADAPCITYò project in years 2014-2018) as well as partner cities. Its major objective was assessment of the sensitivity to climate change of the largest Polish cities and planning adaptation activities appropriate for the identified threats. Project had long-term assumptions (period up to 2030, with a perspective to 2050), therefore it was based on the latest scenarios recommended by the IPCC, of which two were preferred: RCP 4.5 and RCP 8.5.

City of Slupsk, as one of the 44 cities covered by the MPA Project, was also obliged to prepare such document (*Appendix 5.2*). According to analyzes, the most sensitive sectors to climate change in city of Slupsk are public health, water management, transport and biodiversity. Taking into account forecasts and trends for RCP scenarios, by 2050 it is expected that:

- maximum air temperature will increase (increase in the number of hot days with maximum temperature above 30°C; average annual temperature increase; more frequent heat waves),
- minimal air temperature will decrease (reduction of frosty days number; increase of the minimum temperature of winter; fewer days with temperature below 0°C),
- occurrence of long rainless periods combined with temperature above 25°C will be observed (although number of periods longer than 5 days a year without precipitation will not change),
- annual rainfall will increase as well as the number of days with moderately strong precipitation (>10 mm/24h) and strong precipitation (>20mm/24h),
- occurrence of sudden, local urban floods will be observed as a result of heavy, short-term rainfalls with high efficiency,
- storms and strong winds will also be more frequent.

To sum up, at this moment the most recent documents defining the adaptation strategy to climate change for Poland are adaptation plans for particular cities (MPA). Their assumptions have been implemented from 2019 and were based on current IPCC recommendations. However, due to the lack of updated national adaptation strategy to climate change, A1B scenario as well as RCP scenarios (4.5/8.5) are still considered. Therefore the output data corresponding to the A1B scenario simulations were used for building the model for the NOAH Project, with possibility of its replacement in the near future by RCP scenarios preferred in other European Countries - RCP 4.5 scenario or extreme variant: RCP 8.5.

References:

NAS 2020 (*Appendix 5.1):*
https://klimada.mos.gov.pl/wp-content/uploads/2014/12/ENG_SPA2020_final.pdf

KLIMADA Project: http://klimada.mos.gov.pl/en/

Urban Adaptation Plans (MPA): http://44mpa.pl/?lang=en

Appendix 5.2: Climate Change Adaptation Plan for city of Slupsk

2.6. SWEDEN

In Sweden the Rossby Centre at the Swedish Meteorological and Hydrological Institute (SMHI) is responsible for developing climate scenarios at the national and regional level. Two different scenarios are generally used in Sweden: the RCP 4.5 and the RCP 8.5. Specific report for each county was prepared, also for County of Gävleborg (Gävleborgslän), part of which is Söderhamn. The report describes todayĝs and future climate in Gävleborg County based on observations and climate modelling. Regional modelled RCP4.5 and RCP8.5 scenarios have been further downscaled to 4×4 km^2 resolution. The results are presented as meteorological and hydrological indices based on statistically processed model data.

Climate change in Gävleborg County depends on the future amount of greenhouse gases. Temperatures in the Gävleborg area have been estimated to rise by 3 grades according to RCP 4.5 and approximately by 5 grades according to RCP 8.5 by the end of the century. The most notable warming is expected to happen in the wintertime, up until 6 grades according to RCP 8.5.

The length of the growing season will rise with 1-2 months and the amount of warm days will increase. The average yearly precipitation rises by 20-30 %. The precipitation rises the most in wintertime, for the western parts of the county RCP 8.5 displays a 50 % rise. Heavy rainfall rises, as well, the maximum rainfall of a day can rise by 15- 20% depending on the RCP scenario.

The number of days with snow varies around the county. According to the climate scenarios, the snow cover generally decreases in the county but foremost in the southern parts. The number of days of the ground being damp rises in the future, from todayĝs 10-15 days up to 25-35 days by the end of the century.

References:

Appendix 6: FramtidsklimatiGävleborgslän- enligt RCP-scenarier

SMHI Official Website: http://www.smhi.se/en/climate/climate-scenarios/

3. Summary

Climate change scenario enable multi-layered forecasting "what would happen if?ò. There is no certainty that one of them will actually come true. It is more likely that changes in average Earth's surface temperatures and other climate indicators will be intermediate.

The partners of NOAH project as representative of 6 countries: Denmark, Estonia, Finland, Latvia, Poland and Sweden chose 3 scenarios: RCP 4.5 and 8.5 as well as A1B (for Poland). Data obtained from selected scenarios will constitute boundary conditions for building models.