Alternative Scenarios for Blue Growth

FUTURE IMAGES

BLUE ECONOMY SECTOR	SUSTAINABILITY ABOVE ALL!	UNLIMITED GROWTH	SUSTAINABILITY DILEMMA	VIRTUAL REALITY
Energy	Strong environmental policies and legislation have led to decarbonisation. Smart, distributed energy production; renewable energy sources are used. Saving of energy; optimization of energy use. Innovative cleantech –based energy production.	Economic growth is based on the use of traditional fossil and nuclear energy. Heavy industrial production maintains centralized energy production, current and old technologies are used. Weak environmental legislation.	New and old energy production exist side by side, decarbonisation has not succeeded. Aim to self-sufficiency in energy production. Slightly modernized technologies used.	Extensively digitalised society: need to use natural resources changes because of changing human behaviour. Enormously increasing need for energy. Major break-through in smart grids has been reached.
Maritime	Zero emission policies - low emission renewables used in shipping. Strong environmental leadership. Modern shipbuilding and innovations: the environmental impact of ships is designed to be as small as possible. Ports and ships use their waste at the maximum level. Advanced intelligent maritime systems used, autonomous vessels operate in the Baltic Sea.	Increasing global consumption and heavy maritime traffic. Minimum environmental requirements are fulfilled in shipping. Current technologies used in the maritime cluster. Mainly fossil fuels and other unsustainable fuels used in shipping.	Mix of renewable and fossil fuels used. Attitudes impact on choices: some shipping companies use renewables, others use traditional fossil fuels. Economic revenues are considered more important than sustainable values.	Extensive digitalization, local production such as 3D printing, and optimization of logistics have drastically reduced the need for maritime transport, except raw materials. Unmanned vessels operate on the Gulf of Finland and Archipelago Sea. Internet of Things in cargo handling.
Tourism, culture and services for leisure activities	The safe and secure Baltic Sea Region has enabled the development of sustainable tourism. Restrictions for tourists to enter certain conservation areas. Well working, unified ICT systems; digitalisation allows easy use of travel related data for planning, reservations, and information on the destination.	Strong growth has led to increasing mass tourism and environmental damage. All the different planned transport options have been realized. Attitudes towards the environment and sustainability are careless, as is towards local residents. Unsustainable ways of travelling prevail. Clear water is important and rare.	Global tourism has increased. Tourists have different likes; various means of travelling are used and different destinations visited. Concern about the impact of tourism on the environment, but lack of environmental leadership and preparedness for the rise of tourist flows. Different smart technologies are available but they are not user-friendly.	People travel less, and prefer to experience destinations at home with augmented reality. New types of tourism have been developed, with facilities offering blue care and health services from the sea, and 5D digital simulations on ocean swimming and sunbathing.
Blue bioeconomy and subsea resources	Sustainable, circular economy based blue bioeconomy. New bio-based products are cultivated in the sea. Systems are sold to global markets. People are interested in locally produced food. Environmental policy and legislation restrict the emissions caused by blue bioeconomy and the subsea, and the over-exploitation of subsea resources.	Subsea resources and fish stocks are overexploited. Aquatic flora and fauna suffer from deteriorating of the environment and the consequences of climate change. The production and availability of blue bioeconomy has decreased. Attitudes towards the environment and sustainability are careless.	Awareness of the environmental problems and their impacts on blue bioeconomy, but old technologies are used instead of innovative systems. Old customs and consumer habits prevail. Conflicts of different sea use continue. Small measures addressing environmental impacts despite concerns and sea pollution.	Resource wisdom: digital-based production and circular economy. New, digital offshore aquaculture technologies are used, for example independent, floating aquaculture units. Automation used in blue bioeconomies and the subsea.

Pathways to future images

ENERGY SECTOR

SUSTAINABILITY ABOVE ALL! "Environmental awakening"	The attitudes of all, citizens and political decision makers, will change remarkably. Decisions will be based on scientific knowledge. Strong environmental policy and legislation will be introduced: new stricter targets and environmental taxes. New innovations for saving energy.
UNLIMITED GROWTH "Nothing will be done, no decisions will be made, and thus the current state will continue"	No commitment to promote sustainability via international agreements or EU regulations. Because of fast economic growth existing energy infrastructure will be used. In Finland, current investments into nuclear power plants will bind for decades and hinder the development of renewable energy production.
SUSTAINABILITY DILEMMA "Balancing between different interests"	Political budget-support and financial systems are too interlinked, corrupted, and there is no interest in change. Weak development of global economy will affect development. The political situation in neighboring area leads to highlighting energy self-sufficiency, slowing down development of alternate production and its promotion.
VIRTUAL REALITY "Extensively digitalized society"	Strong governmental support for digitalization and virtual solutions leads to further digitalization and greater need for energy. Internet of Things monitors energy consumption in every device and spot. Later a fully digitalized future means a decrease in energy consumption, due to decrease in mobility. Smart, decentralized systems, grids and pipelines will be developed. Support for rural areas and expanded opportunities for distant working will increase. People consume much less.

MARITIME SECTOR

SUSTAINABILITY ABOVE ALL! "Zero emissions"	Policy will towards sustainability will lead to global climate agreement and strong legislation proposing zero emissions will be introduced. Strong environmental leadership. Environmental thinking will be strengthened in maritime education: it will create more favorable attitudes among the people in the industry. Technological solutions, ICT and digitalization will support sustainability. Most vessels are autonomous and cargo handling will be automatized to optimize cargo transport, and to minimize the environmental impact of shipping.
UNLIMITED GROWTH "Do nothing and continue in an old-fashioned way"	Today's support and fiscal policy will continue, with small reforms on taxation, EU-support and local political systems. Low awareness of environmental problems, more consumption and production, bigger vessels, people buy more. Fossil fuel from Arctic: oil and LNG. Multifunctional ships will carry new cargo types, such as waste. There will be more offshore services, port congestion and new waiting areas.
SUSTAINABILITY DILEMMA "Profit drives business"	Lack of regulation, or no common regulation. Inconsistency in energy, environmental policies and legislation. No strategy with a vision of sustainable economy in the long-term. Political systems and businesses are too closely interlinked. Profit drives business, both politicians and businesses are beneficiaries of the current system and there is no motivation to change the system. No price on carbon in climate policy.
VIRTUAL REALITY "Autonomous will be enabled by regulations"	Autonomous transport will be enabled by regulations, and by providing the best conditions for testing and trial runs of new technologies and solutions. Development and innovations at universities in close cooperation with the industry. A greater need for new technology creates the conditions for new companies to develop and create the required equipment. 3D printing develops with an unexpected space and with no problems. Renewal of business models.

TOURISM, CULTURE AND SERVICES FOR LEISURE ACTIVITIES

SUSTAINABILITY ABOVE ALL! "Tourists participate in activities for sustainable tourism: rebuilding ecosystems, reducing nutrients"	The attitudes of the travelers themselves towards sustainability will change. A ranking-price system based on the impact and pressure to the environment will be introduced; tourists pay for the externalities that their actions cost. Areas of mass tourism and restricted areas will be determined and specific sectors for travelers will be established. Sustainability will be developed by co-operation of sectors. Sustainable energy for travelling will be used.
UNLIMITED GROWTH "All resources are used maximally, and the maximum is also taken from nature"	All the different planned transport options will be realized; Helsinki-Tallinn tunnel will be built, artificial islands etc. At the beginning, tourism will increase. There will be a lot of different cruise ships and routes, and for example fishing tourism. Further on, the amount of tourism will start to decline because of the bad state of the environment.
SUSTAINABILITY DILEMMA "Weak environmental leadership"	Weak environmental leadership, lack of knowledge and information and too cheap travelling. Weak digital skills and preparedness in companies. Poor preparedness and restricted possibilities of companies to react fast to constantly changing global user needs. Tourism industry develops, but without cooperation between different instances. No common goal.
VIRTUAL REALITY "Swim around as a fish"	Extensive digitalization will lead to development of virtual 3D models of sites, augmented reality. Internet of Things (IoT) - objects will be more extensively connected. Avatars. Expended memory and emotions. 2050; plenty of cultural heritage sites in 5D? Virtual tour of the Baltic Sea. Change in family models – robots, cyborgs. Slaves?

BLUE BIOECONOMY AND SUBSEA

SUSTAINABILITY ABOVE ALL! "We don't pollute"	Countries will start immediately and efficiently to implement the UN Sustainable Development Goals. Cleantech and innovations in bioeconomy technologies, e.g. multitrophic aquaculture. Circular fish farming and subsea mineral extraction. Efficient interaction of different smart, ubiquitous technologies.
UNLIMITED GROWTH "Do nothing, pretend everything is under control with some more regulations and reforms"	No environmental leadership. No focus on environmental thinking in schools. No control of the overall picture, poor cooperation. Decision makers are not educated on issues related to blue bioeconomy. Accelerating of economic development and continuing economic boom will increase the flow of tourists in the BSR, and will also have an impact on the unsustainable over-exploitation of the sea space. The building of the Helsinki-Tallinn tunnel will increase sand and gravel extraction, more fish farms will be established on the coasts.
SUSTAINABILITY DILEMMA "Weak environmental leadership"	Weak environmental leadership and no innovation. No common focus on circular economy. The Baltic Sea Region states will proceed in different timing in their operations. The price of new technologies continues to be high.
VIRTUAL REALITY "New product and service models are being built"	EU funding is provided for experimental projects and for risk investments. New product and service models are being built. Environmental legislation will be changed so that permits to moving platforms can be granted.