Vlaanderen
is omgeving

BASELINE SCENARIOS FOR THE FUTURE OF THE PHYSICAL ENVIRONMENT

SUMMARY REPORT

DEPARTEMENT
OMGEVING

omgevingvlaanderen.be

This report contains the opinion of external author(s) and not necessarily those of the Flemish government.

COLOPHON

Publisher
Peter Cabus
Department of Environment
Koning Albert II-laan 20 bus 8, 1000 Brussels, Belgium
www.omgevingvlaanderen.be

This is a publication of the Department of Environment,
branch Vlaams Planbureau voor Omgeving *(Flemish planning office for environment)*
vpo.omgeving@vlaanderen.be

Authors
Vlaams Planbureau voor Omgeving, Department of Environment

Gommers Annick, Verhaegen Katelijne, Couderé Koen – KENTER
Libbrecht Steven – ESSET

Publication date
July 7, 2023

Depot number
D/2023/3241/243

ISBN number
9789040304590

Reference
Gommers, A., Verhaegen, K., Couderé, K. (KENTER)
in cooperation with Libbrecht, S. (ESSET) (2022), *Basisscenario's voor de toekomst van de fysieke leefomgeving,* commissioned by 'Vlaams Planbureau voor Omgeving'.

PARTNERS

TABLE OF CONTENTS

1 INTRODUCTION

This English summary report is based on the report “Basisscenario’s voor de toekomst van de fysieke leefomgeving” commissioned by the Department of Environment as part of the Flemish government and conducted by consultancy firm Kenter and Esset. The original report can be found here:
https://www.vlaanderen.be/publicaties/basisscenarios-voor-de-toekomst-van-de-fysieke-leefomgeving

In order to get a better grip on the complexity and uncertainties with which the Flemish policy makers and administrations have to deal, the Department of Environment felt the need to develop a set of ”baseline scenarios” for the future of the physical environment.

A scenario is a story about how the future - in this case, the physical environment in Flanders in 2050 - may unfold and look. It tells how the future may develop, based on an analysis of relevant driving forces - factors from the broader context that have an impact on the development of the physical environment. As the future cannot be predicted, it is important to draw up more than one scenario, to have a set of (context) scenarios: multiple possible futures, clearly different from each other, but each, nevertheless, plausible.

The scenarios must be suitable to be used in a strategic policy context as well as within explorations and (research) projects that are linked to it. Within this assignment, the scenarios are positioned as a set of baseline scenarios, because they are intended to also be used outside of the Department of Environment. In order to develop these baseline scenarios, a co-creation trajectory was designed and organised involving a group of policy staff members from within the Environment policy area as well as a number of experts from outside the Environment policy area. The set of baseline scenarios should consist of internally consistent and credible images of possible futures of the physical environment.

Below, we summarise the process that was followed and the results and products that have emerged from it.

The actual trajectory of cocreation consisted of three steps:

- A two-day workshop to identify the scenarios based on (un)certain driving forces;
- A workshop to estimate the impact of the scenarios on the physical environment; and
- A workshop to explore the application possibilities of the scenarios.

These co-creation steps were complemented by many additional activities, such as: discussions between the client and external consultants, desktop research, bilateral discussions with external experts, input that was requested as “homework” from the participants in the co-creation process.

2 (UN)CERTAIN DRIVING FORCES

In order to develop scenarios of the future, in-depth understanding of the (un)certain driving forces that will determine the future of the physical environment is needed. In a two-day workshop, an exercise was carried out with the participants in the co-creation process to identify the most important driving forces and to determine which of these important driving forces are trends (having a clear evolution) and which are uncertainties (having an intrinsically uncertain evolution).

2.1 TRENDS

It was concluded that the following trends will be important for the future of the physical environment:

Climate change

Climate change is defined as the total of natural phenomena, impacts, and effects caused by the rise of average temperatures within the atmosphere. This shift is triggered due to an increasing concentration of greenhouse gases, both by human activities and natural evolution. It is accompanied by important consequences, such as rising sea levels, increased annual precipitation, a greater number of dry days per year, an increase in the risk of flooding from the sea and from rivers.

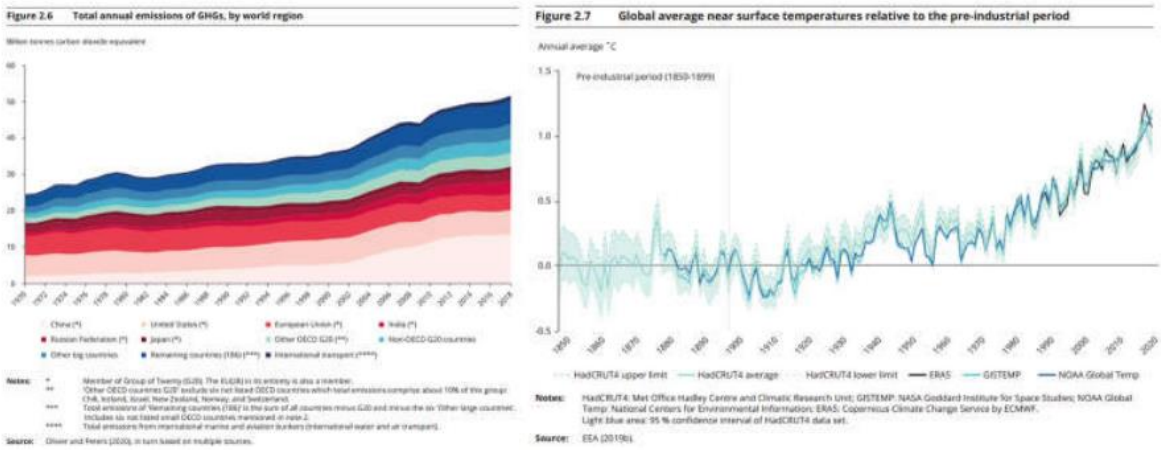


Figure 1: Total worldwide emission of greenhouse gases (left) and the average temperature on earth (right)
(Source: European Environment Agency (2020) Drivers of Change of relevance for Europe's environment and sustainability)

Demographic developments

Demographic trends show a slight increase of the population in Flanders until 2030, after which the this number would remain more or less stable. There also seems to be a balance between immigration and emigration, but we see a shift towards immigration from non-EU countries.

In addition to these two trends, the increased pressure on ecosystems and biodiversity was named as a probable development during the workshops. While the loss of biodiversity is a threat for food security and public health, it is not considered to be a mega trend. This development can also be seen as a specific consequence of climate change.

2.2 UNCERTAIN DRIVING FORCES

Besides the previously defined probable trends, some uncertainties were identified that will have an impact on the future of the physical environment. The uncertain driving forces that will have the greatest impact are listed below, together with the extreme positions between which future evolutions are possible. They are grouped together in the following categories:

Key uncertainties, which determined the main characterisation and differentiation of the scenarios:

- *Dominant system of value creation:* one-sided financial vs. social welfare (3Ps);
- *Dominant forces in society:* make society more conservationist vs. more welcoming to change

Uncertainties related to social systems:

- *Organisation of production chains*: global and linear vs. local and circular;
- *Degree of energy self-sufficiency in Flanders*: not self-sufficient vs. largely self-sufficient;
- *Way in which transport modes are used*: transport modes are not used optimally, flexibly and sustainably vs. transport modes are used optimally, flexibly and sustainably;
- *Food supply model*: not socially, equitably and environmentally friendly vs. socially, equitably and environmentally friendly
- *Settlement characterisation*: rather spacious and monofunctional vs. rather compact, multifunctional with proximity to services;

Uncertainties related to human behaviour:

- *Human image*: individual possession, individual freedom, "I" vs. sharing, cooperation, "WE";
- *Consumption behaviour*: impact of consumption is not a criterion for making choices vs. choices based on (assumed) impact;

Uncertainties related to societal organisation:

- *Attitude of government*: reactive vs. proactive; – Citizen participation: low degree of participation vs. high degree of participation;
- *Inequality*: high inequality vs. low inequality.

3 FOUR BASELINE SCENARIOS

Through varying combinations of the key uncertainties, four scenarios were characterised and identified that are relevant to the future of the physical environment. These four scenarios were outlined during the first two-day workshop. For each of the scenarios, a narrative was written (storyline outlining the future evolution): in short (1 page) and longer (several pages) form. The endpoints of the scenarios ('snapshots 2050') were also captured in a detailed drawing. Finally, photographs were sought that illustrate what the society could be like according to the different scenarios. This material is included in this report. Below we summarise the outlines of each of the scenarios. The scenarios are indicated with their working titles. The main titles are translations of the Dutch words Gemeengoed *(Common Good)*, Voorspoed *(Prosperity)*, Zondvloed *(Deluge)* and Overmoed *(Overconfidence)*.

Figure 2: Scenario logic, with indication of the four baseline scenarios

3.1 SCENARIO I – THE AMISH / COMMON GOOD/ BUBBLE

This scenario is characterised by a combination of a conservative society and a dominant system of value creation aimed at social welfare. As a result of the crises in the 2020s and as no solutions are offered by governments on a supra-local scale, communities are increasingly organising themselves locally. The self-preservation idea is central. Cooperatives ensure self-sufficiency within the local community. Flanders is becoming a patchwork of local autonomous communities, each of which tries to function as sustainably as possible and where life is usually good. Problems that exceed the means of a local community cannot be tackled sufficiently.

LANDSCAPE



FOOD SYSTEM




ENERGY PRODUCTION




REPARATION


CARING SOCIETY

MOBILITY


SUPERMARKT

3.2 SCENARIO II: DONUT / PROSPERITY / EARTH

This scenario is characterised by a combination of a change-minded society and a dominant system of value creation geared towards social welfare. From the crises of the 2020s, a recovery programme emerges that focuses on sustainability and digital development. There is a growing awareness among all actors in society that a fundamentally different way of living and producing is needed to stop the major problems. This results in a gradual but complete behavioural change. Governments and citizens are working together with the same goal in mind. Society in 2050 is characterised by an amalgamation of local, small-scale initiatives and international, large-scale developments in order to work towards the international sustainability goals. It is good to live in this solidarity-based society, where attention is paid to the welfare of all and there is room once again for a healthy public and green space.

COMPACT GREEN CITY

SQUARES AND PARCS

AGRICULTURE & FOOD

INDUSTRY

RECREATION

ENERGY PRODUCTION

PARTICIPATIVE SOCIETY


DEBAT
FARM
BUS

3.3 SCENARIO III: FEND FOR YOUR OWN / DELUGE / UMBILICUS

This scenario is characterised by a combination of a conservative society and a dominant system of value creation with unilateral financial objectives. The government has no adequate answer to the crises of the 2020s, putting people on the street and the threat of total chaos looms large. At the same time, geopolitical tension is growing internationally and Russia and China, among others, are withdrawing from international treaties. Populism is rampant in Europe (and in Flanders). The government apparatus is being cut back; Flemish policy is unilaterally focused on short-term economic profit maximisation. Environmental legislation that is considered a hindrance to the economy is being scaled back. In order to secure their own financial status, wealthy citizens make use of financial opportunities, for example by buying up agricultural land as an investment. Inequality in society is increasing. By 2050, society will have evolved into a polarised society. Those lucky enough to be born in a gated community have opportunities. For all others, life is a daily struggle for survival.

GATED COMMUNITIES

POLLUTION & DECAY

AGRICULTURE - DROUGHT

FLOODS

SOCIAL INEQUALITIES

FOOD PRODUCTION


SCHOOL
BEZOEK EEN BOOM BO

3.4 SCENARIO IV: ELON MUSK / HUBRIS / MARS

The scenario is characterised by a combination of a change-minded society and a dominant system of value creation that has one-sided financial objectives. The crises of the 2020s have been a sign for the business world to accelerate innovation. The general belief in technological solutions grows when people realise that technology has the power to provide real solutions to pressing (societal) challenges. Society is becoming more and more high-tech: “Big data” and “predictive analytics” are being used on a large scale to monitor people’s health. Cities and homes are transforming according to principles such as ’smart’, ’connected’, ’AI driven’. The other side of the coin of this evolution is the loss of jobs due to artificial intelligence and robotisation, and the growing social unrest. To combat this unrest, the government is introducing a ’basic income’ as well as an extensive education and healthcare package. In 2050, society will have evolved into a data-driven and controlled high-tech society. A small group of people who could no longer or did not want to participate in this society lives namelessly in the feral zones of abandoned farmland.

SMART CITIES

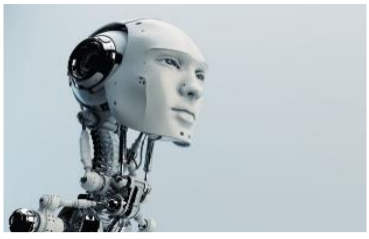
ENERGY MIX

HIGH TECH AGRICULTURE

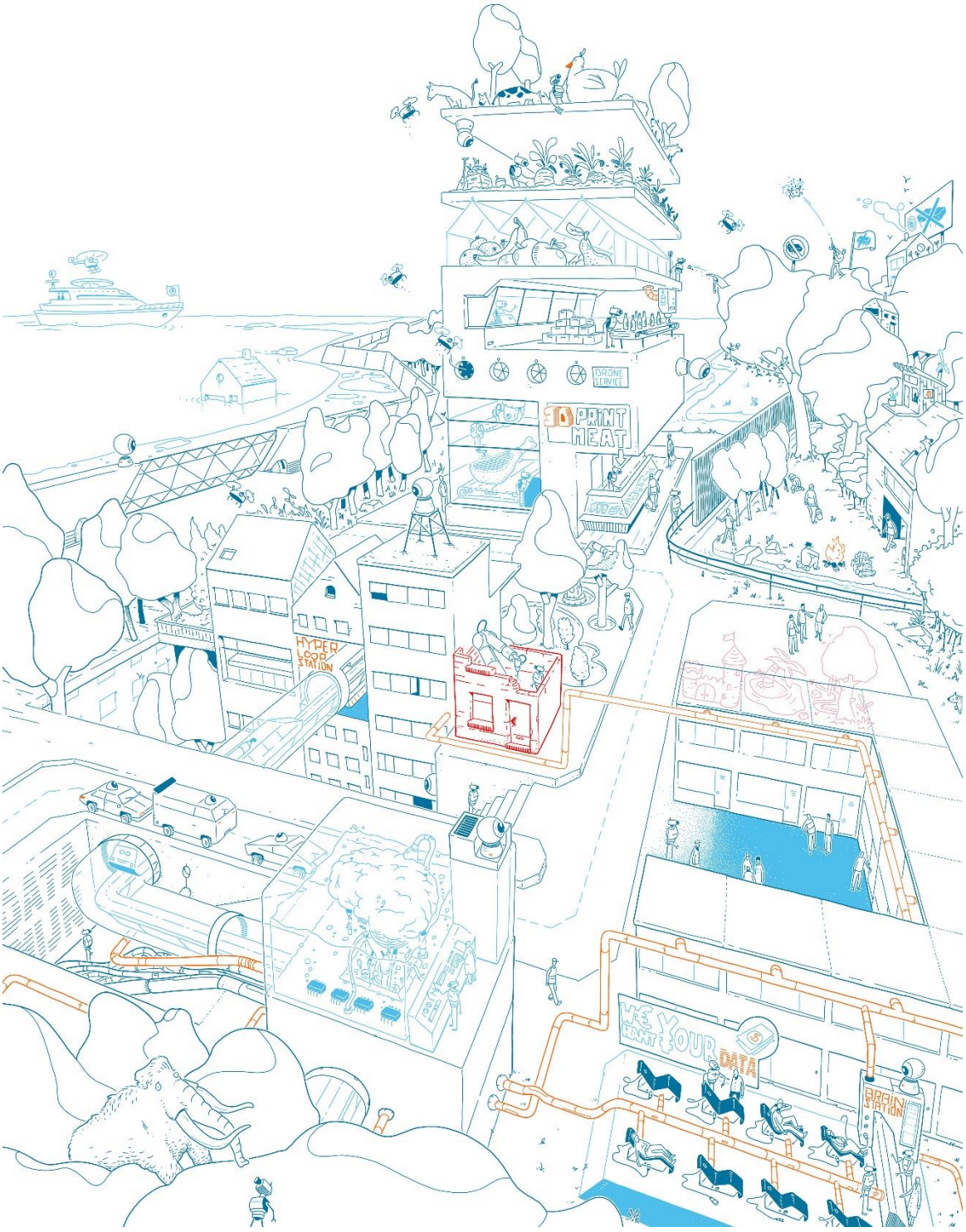
HIGH-TECH FOOD

AUTOMATIC TRANSPORT

MONITORED SOCIETY



WILDNESS


DRONE SERVICE
PRINT MEAT
HYPER LOOP STATION
WE PRINT YOUR DATA
BRAIN STATION

4 IMPACT ON THE PHYSICAL ENVIRONMENT

Together with the participants in the co-creation process, the impact of each of these scenarios on the future of the physical environment was assessed, both in terms of environmental characteristics of the physical environment, spatial characteristics as well as in terms of stocks and health.

An overview was created from which - not surprisingly - it can be deduced that most parameters of the physical environment evolve positively in the scenario in which a change-minded society goes hand in hand with value creation aimed at social welfare (scenario II) and negatively in the scenario in which a conservation-minded society goes hand in hand with unilateral financial value creation (scenario III). In the high-tech society (Scenario IV), several parameters relating to the physical environment evolve in a negative direction, but there are also opportunities for an evolution towards increased sustainability, to the extent that they are supported by a financially attractive business model. In a society that evolves towards local communities becoming as self-sufficient as possible (Scenario I), the evolution is less positive than in Scenario II, but still predominantly positive (especially within the community). However, sustainability objectives are not achieved.

The next section shows the impact on the physical environment in a schematical way. The effects are structured into the following subcategories: environmental properties, spatial properties, supply stocks and health.
The diagrams can be understood by the following legend, which applies to all categories.

↗	Increase, growth, more than	RED	Deterioration
↘	Decrease, reduction, less than	YELLOW	Status quo
→	Remains the same	LIGHT GREEN	Small improvement
		DARK GREEN	Large improvement

* all status changes are relative to the present situation

The appearance of two arrows, such as occurs in Scenario III, indicates that the situation is different for the affluent part of the population (e.g., gated communities – left arrow) than for the other part of the population (right arrow).

IMPACT ON THE PHYSICAL ENVIRONMENT

ENVIRONMENTAL QUALITIES

ENVIRONMENTAL QUALITIES	SCEN. I Common Good	SCEN. II Prosperity	SCEN. III Deluge	SCEN. IV Overconfidence
AIR QUALITY				
(General) emissions	→	↘	↗	↘
Greenhouse gases	↘	↘	↗	→
Ammonia emissions (livestock)	↘	↘	↗	↘
WATER QUALITY				
Surface water	→	↗	↘	→
Groundwater	↗	↗	↘	→
Drinking water	→	→	↘	→
Recreational water	→	↗	↘	↗
Biological water	↗	↗	↘	↘
SOIL QUALITY				
Fertile soils	↗	↗	↘	↗
Erosion	↘	↘	↘	↘
CHEMICALS OF CONCERN IN PRODUCTION				
Use during production	→	↘	↗	→
Contamination with microplastics	↘	↘	↗	→
LOCAL CLIMATE & ADAPTATION	↗	↗	↗ | ↘	→
NOISE, SCENT, …	→	↗	↗ | ↘	↗
WASTE				
Waste creation	↘	↘	↗	↗
Circular use of materials	↘	↗	↘	↗

SPATIAL QUALITIES

SPATIAL QUALITIES	SCEN. I Common Good	SCEN. II Prosperity	SCEN. III Deluge	SCEN. IV Overconfidence
SETTLEMENTS				
Green in neighbourhoods	→	↗	↗ | ↘	↘
Densification	↗	↗	↘	↗
Private -> multifunctional gardens	↗	↗	↘ | ↗	→
LAND TAKE, HARDENING	→	↘	↗	↗
INFRASTRUCTURE				
Energy	Decentralised	Decentralised production/ central energy system	Decentral for the rich	Central? Depends on new technologies
Shared infrastructure -> limiting land take	↗	↗	↘	↘
SPACE FOR FACILITIES	Small scale/ shared	Sustainable/ shared	For elite/ little for the poor	Online – Little land take

HERITAGE	
Architectural heritage	
Cultural-historical landscapes	
Archaeological heritage	
LANDSCAPE AND OPEN SPACES	
Open space as ecosystem service provider	
Amount of wasteland	
Natural course of waterways	

SUPPLY STOCK

SUPPLY STOCK	SCEN. I Common Good	SCEN. II Prosperity	SCEN. III Deluge	SCEN. IV Overconfidence
RAW MATERIALS				
Use of primary raw materials				
Use of secondary raw materials				
General level of consumption				
ENERGY SOURCES IN FLANDERS				
Energy efficiency				
Availability local energy sources				
WATER RESERVES				
Water usage				
Attention to infiltration rainwater				
Collection and use of rainwater				
(Ground)water stocks				
Impact on water footprint outside of Flanders				
NATURE, FOREST & BIODIVERSITY				
Biodiversity				
Green infrastructure				
Protected nature				
AGRICULTURAL LAND & SOIL				
Stock agricultural land				
Soil				
Agricultural landscapes				

HEALTH

HEALTH	SCEN. I Common Good	SCEN. II Prosperity	SCEN. III Deluge	SCEN. IV Overconfidence
NUISANCE				
Living quality (extent of nuisance)				
Subjective experience of nuisances				
Visual pollution				
PHYSICAL HEALTH				
Physical safety (traffic, crime, etc)				
Prevention policies for physical health				
Policies for chemical substances				
Presence of waterborne diseases				
Effective approach to pandemics				
MENTAL HEALTH				
Attention to mental health within society				
Prevention policies for mental health				
Evolution of the mental health of the population				

5 APPLICATIONS AND RECOMMENDATIONS

In a final workshop with the participants in the co-creation process, it was explored how the use of these kind of scenarios can be applied in policy-making or policy-supporting research. Based on the policy objective stated in the seventh environmental action programme of the European Union - "In 2050, we will lead a good life within the limits of the planet" - three priority objectives were translated into concrete policy goals (i.e., biodiversity objectives, land use, access to sufficient and good-quality drinking water). The four defined scenarios were used to carry out a stress test of this existing policy. That means that the likeliness that the predetermined objectives will be met was investigated for each scenario. Furthermore, the policy options that should be implemented now were examined, taking into account the uncertainties of future evolutions. Assessments of possible future situations can be applied in order to draw up robust policy sets. Awareness of how various uncertain factors can change the future of our environments allows policy makers to react in a proactive, dynamic, and flexible manner to new developments.

This exercise had only an exploratory character: an introduction to one of several possibilities to use scenarios as a policy-supporting instrument. A concrete and realistic application would require a longer and more intensive process, in which the participative process steps are taken with sufficient depth, complemented with desktop research, and properly tested and validated. As this was not the objective of the exercise, the results have not been included in the report.

Reactions of the participants after participating in the exercise indicated that the advantage of working with scenarios to strengthen policy (i.e., testing against various possible future scenarios, the importance of daring to think outside the prevailing (policy) context) is clear. They also pointed out the relevancy of doing a similar exercise within other contexts and compare different fields of study through these scenarios.

At the same time, they pointed out the risk that the scenarios could quickly disappear and become forgotten. A recommendation was formulated to provide sufficient capacity within the government to work with scenarios and to prepare products based on the scenarios with a view to communication and dissemination (website, video, etc.).