



## FORESIGHT ON DEMAND

Foresight towards the 2<sup>nd</sup> Strategic Plan  
for Horizon Europe

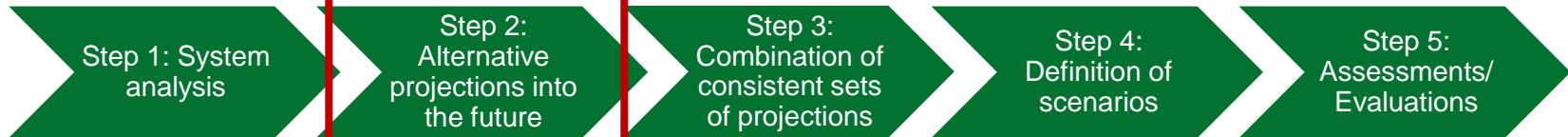
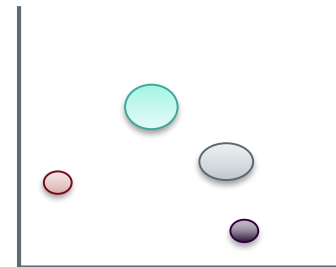
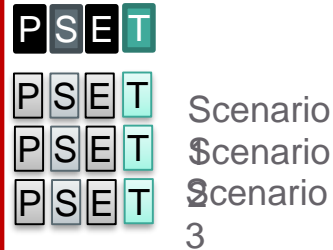
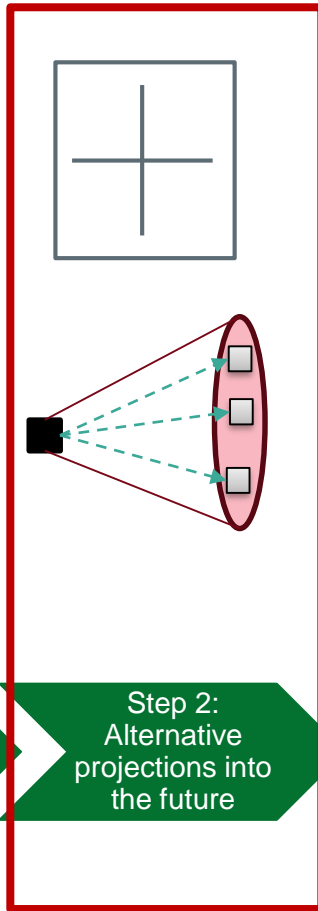
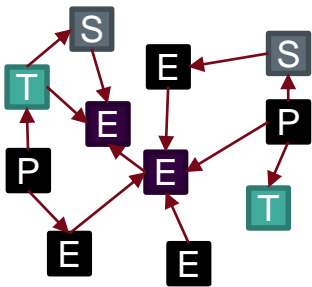
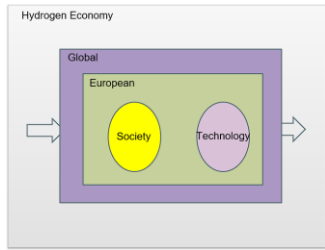
Deep-Dive: Scenarios of an abundant Hydrogen Economy  
2nd Workshop – Building of future projections

# SCENARIOS OF ABUNDANT HYDROGEN ECONOMY

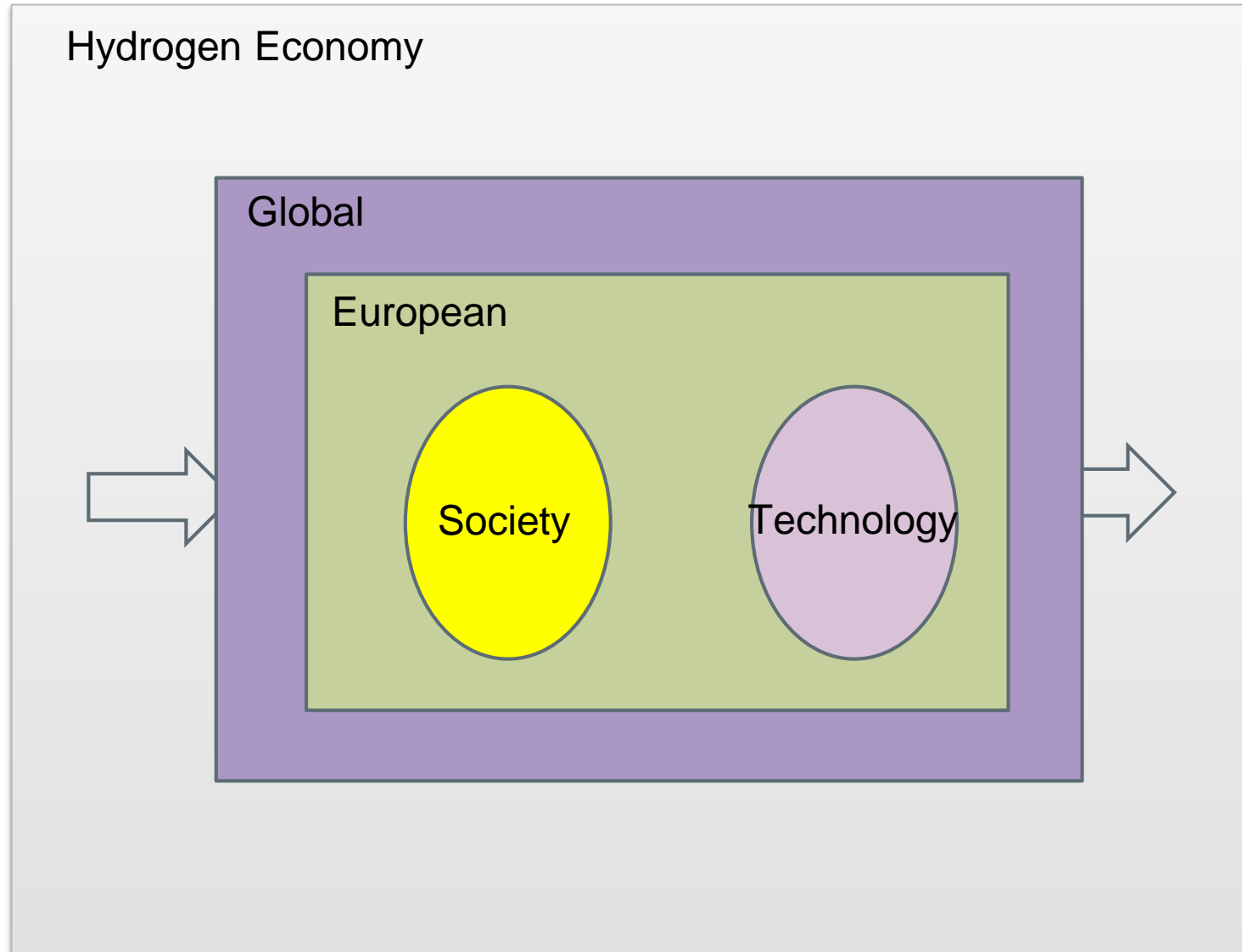
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Title of the Scenarios	Hydrogen Economy in Europe 2040
Geographical Scope	Europe 27 - Embedded in a global context
Time Frame	2040
Purpose of the scenarios	<p>The aim is to develop positive Scenarios: How does Europe look like, when there is abundant fuel (H<sub>2</sub>) available?</p> <p>The exercise is exploratory and open; in the first stage.</p> <p>How can and must European R&amp;I policy support the transition? Where are the obstacles, drivers and barriers?</p> <p>Are we in the risk to run in lock-in-effects? How to prepare the context for the energy transition? Which developments support and hinder the transition?</p>
What's in	The socio-economic, socio-technical socio-environmental developments inside and outside Europe that are influenced by a Hydrogen economy and that influence themselves the transition towards the Hydrogen economy.
What's out	<ul style="list-style-type: none"><li>● Technical details of hydrogen technology, including e.g. electrolysers, fuel cells, transport details and alike.</li><li>● Worst case scenarios.</li></ul>

# HOW TO (SYSTEMATICALLY) THINK ABOUT THE FUTURE? BASIC STEPS OF DEVELOPING SCENARIOS.



# SYSTEM ANALYSIS – SELECTION OF KEYFACTORS



# FINAL LIST OF KEY FACTORS AFTER THE DISCUSSIONS

Global	European	Society	Technology (without Hydrogen)
1 Global power constellations	2 European integration and cohesion	5 Values, preferences and sustainability of lifestyles	6 Organisation of energy systems
4 European and global policy	3 Degree of autonomy and self-sufficiency in Europe		

# (1) Global power constellations



This factor describes the constellation and distribution of political and economic power on a global scale. For years, after the Second World War and during the Cold War, there was a clear bipolarity. With the break-up of the Soviet Union, the growth of the European Union, and the growing role of BRICS countries, the power constellations have changed. This has (had) an effect on global trade, access to raw materials, conflict and migration.

## (2) European integration and cohesion



The factor reflects the status/constitution of the EU. This touches upon the European institutions and the effectiveness of policy and thereby acknowledges the EU institutions by member countries. On the other hand, member countries are rather diverse across Europe. Next to nationalistic tendencies, there might be strong disbalances in terms of economic power and wealth amongst the different countries.

### (3) Autonomy and self-sufficiency of Europe



To what extent Europe can be autonomous (the self-determination of both aims and means of deeds) depends on its self-sufficiency (meaning its ability to provide everything it needs to sustain itself) and hence also on its access to resources (technology, human capital, raw materials, and other resources).





This factor encompasses values, attitudes, and lifestyles in Europe concerning sustainability and its different components. The discourses range from technology affinity to “frugality and back to nature”. Depending on the organisation of the society, wealth and buying power will play a key role.

## (5) European and global policy



In general, the European and global climate policy as well as the overall orientation of industrial and sustainability policy, plays a key role in how to shape the energy future of Europe.

## (6) Organisation of energy systems



Energy systems can be organised around centralised power generation with its ‘one-way’ transport and distribution networks or through distributed energy systems with smart grids allowing ‘two-way’ trade and distribution of generated energy.

# HOW TO BUILD FUTURE PROJECTIONS THEN?



“Do not let the memories of your past limit the potential of your future. There are no limits to what you can achieve on your journey through life, except in your mind.”

— Roy T. Bennett

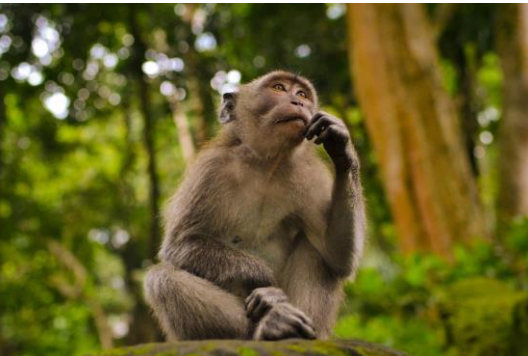
The future depends on what you do today.”

— Mahatma Gandhi

“You never change things by fighting the existing reality.

To change something, build a new model that makes the existing model obsolete.”

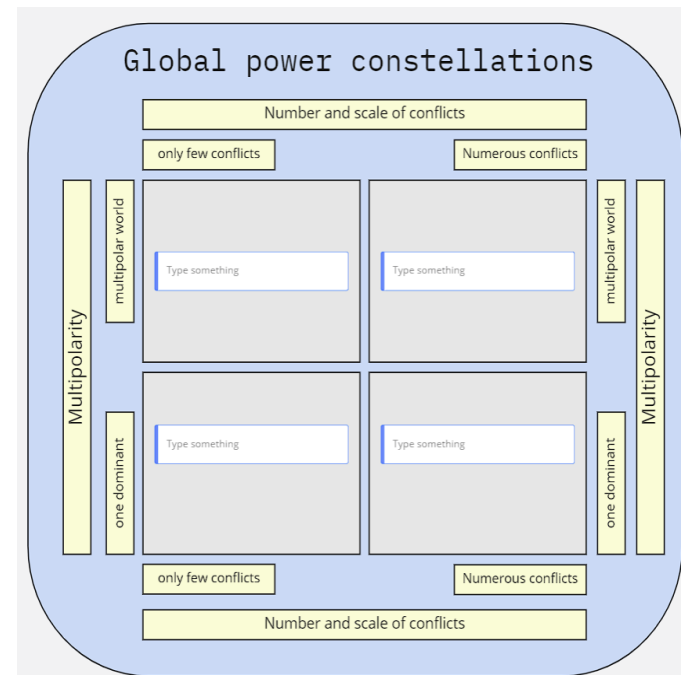
— Buckminster Fuller



# USING MICRO-PORTFOLIOS+

## Key Dimensions

- **Number and scale of conflicts**
- On the one hand, there might be numerous conflicts in different regions of the world caused by religious conflicts, access to resources, climate change impacts, and demographic developments. On the other hand, conflicts might not escalate and remain, if at all, local.
- **Multipolarity**
- There might be one dominant country or region dictating the world agenda – this can be either the US (NATO), China or Russia. Different constellations are possible. It is likely that with one strong region, a form of counterbalance will shape and establish itself. On the other hand, many regions might be on a similar if not the same level.



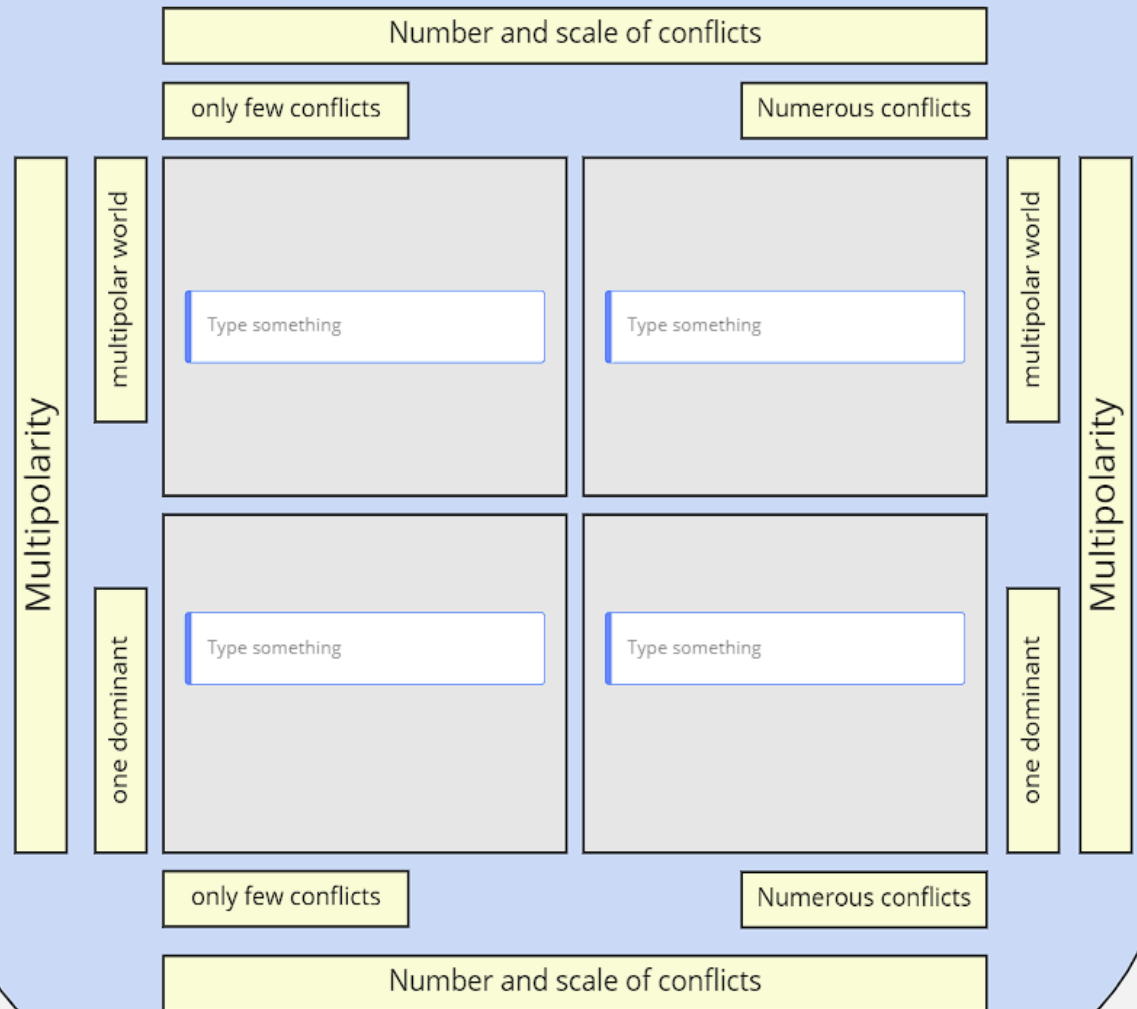
Global power constellations



## Overall discussion



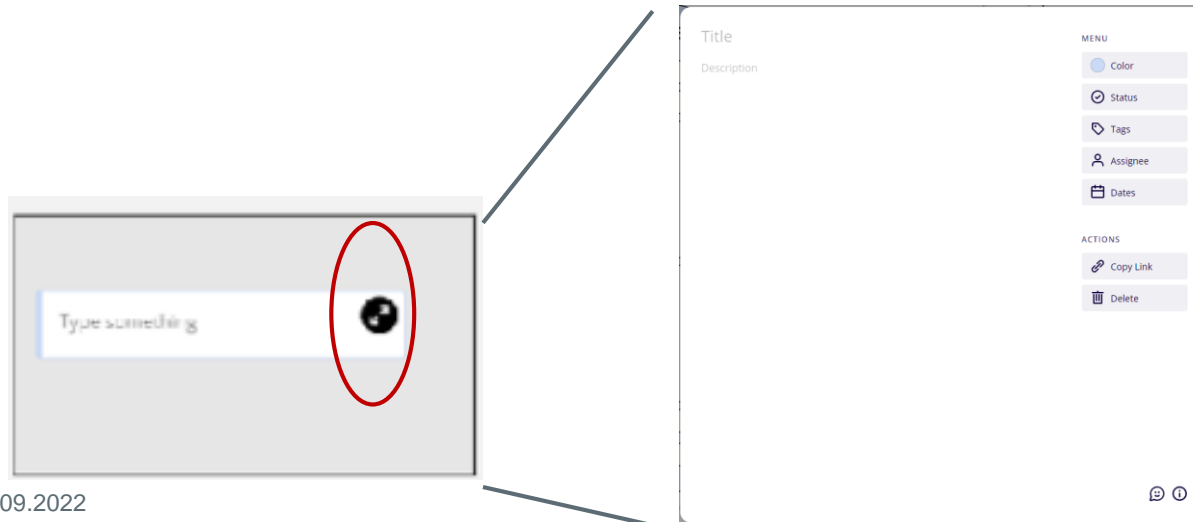
## Global power constellations



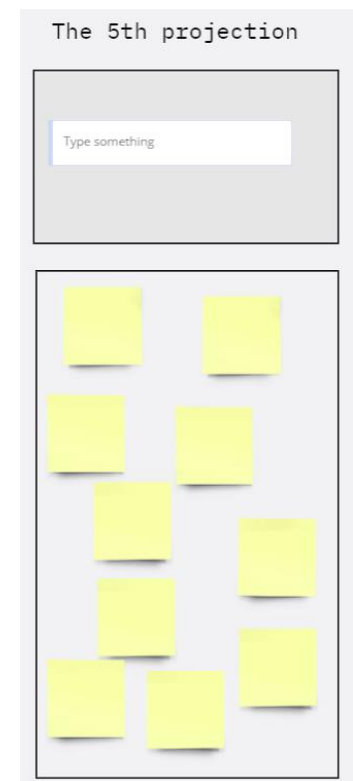
## THE FIFTH PROJECTION...

- What might be a surprise?
- What would be the very optimal projection?
- What would be economically the cheapest (for Europe)?

- Collect some ideas and aspects
- Give it a „catchy“ titel and add some details into the card



13.09.2022



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## YOUR TASK IN THE GROUP DISCUSSIONS

After the discussions we aim to have 4 to 5 future projections for each of the 6 key factors

- We will have two rounds.
- Each breakout group works in the first round on one key factor and in the second round on a second key factor.
- We will build three break out groups and hence will have worked on all six key factors.
- Check the „cards“ on the miro
- First discuss upper right corner of the portfolio check the combination, write down aspects and find a catchy titel for the projection

Factors / aspects not choosen for the elaboration of the scenarios are not lost. They can be used later in the narratives

## TIMING FOR TODAY

<b>Time</b>	<b>What</b>
<b>9:00 - 9:15</b>	Warm up, log in
<b>9:15 - 10:00</b>	Presentation by Ulli: Where are we? What comes next?
<b>10:00 - 10:45</b>	Block 1: work on projections
<b>10:45 -11:00</b>	Reconvene in plenary / small break
<b>11:00 - 11:45</b>	Block 2: work on projections
<b>11:45 -12:00</b>	Plenary: short reflection, next steps

Group 1: (1) Global power constellations, (5) European and global policy

Group 2: (2) European integration and cohesion, (3) Autonomy and self-sufficiency of Europe,

Group 3: (6) Organisation of energy systems, (4) Values, preferences & sustainability of lifestyles

<b>Group 1 (Ulli)</b>	<b>Group 2 (Totti)</b>	<b>Group 3 (Nikolaus)</b>
Rainer	Elisabeth	Corina
Sebastian	Zulandi	Martina
Nikos	Bianca	Mike
Sebastian	Kerstin	Peter

When you are done with your projections you can join another group and help out.

## ACTIONS – GO INTO A GROUP

# NEXT STEPS...

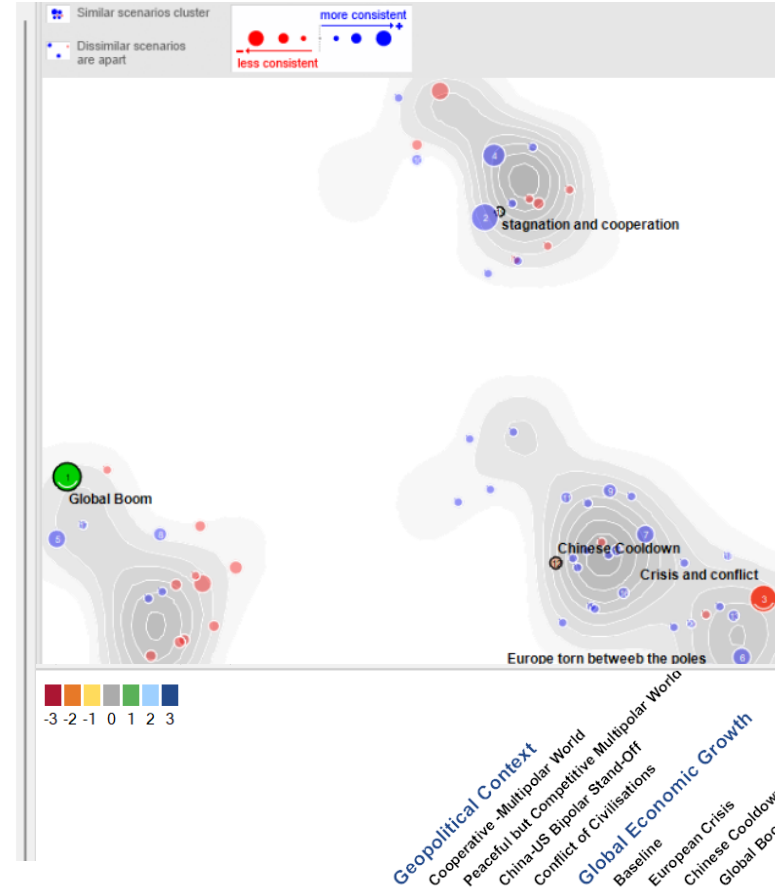
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4	2.00
5	1.67
6	1.67
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9	1.33
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21	0.67
22	0.67
23	0.67
24	0.67
25	0.33
26	0.33
27	0.33
28	0.33

Scenario	C...
Global Boom	2.33
Crisis and conflict	2.33
Chinese Cooldown	1.00
Europe torn between the poles	0.67
stagnation and cooperation	0.67

## Global scenarios 2028

Corona & Pandemie	Geopolitical Context	Global Economic Growth
Crisis subsides quickly	Cooperative - Multipolar World	Baseline
Back to normal in some places, but not in others	Peaceful but Competitive Multipolar World	European Crisis
Crisis drags on, but lock downs are lifted	China-US Bipolar Stand-Off	Chinese Cooldown
Long crisis with repeated lock downs	Conflict of Civilisations	Global Boom



Corona & Pandemie								
Crisis subsides quickly	2	3	0	-1	2	-1	-1	3
Back to normal in some places, but not in others	3	3	-1	1	2	-1	1	-1
Crisis drags on, but lock downs are lifted	2	0	0	0	-1	1	1	-2
Long crisis with repeated lock downs	-1	1	1	2	2	3	1	-3

Geopolitical Context				
Cooperative - Multipolar World	1	-1	-1	2
Peaceful but Competitive Multipolar World	2	-1	-1	-1
China-US Bipolar Stand-Off	-1	1	1	-1
Conflict of Civilisations	2	2	2	-3

## NEXT WORKSHOP ON SEPTEMBER 26<sup>TH</sup>

- If you want to: you can also fill in a consistency matrix in between
- The core-team will suggest 3 - 5 different scenarios
- **The workshop-group will:**
  - Characterise the scenarios (catchy title, short description)
  - Define major steps that need to happen (i.e. distance to today)
  - Collect ideas of major actors, potential losers and winners
  - Collect first implications for the energy and hydrogen system
  - Collect first ideas for policy implications
- **The core team will afterwards:**
  - Elaborate short scenario descriptions (narratives/storylines)
  - Define the hydrogen systems
  - Define the boundary and limiting conditions

# QUICK ROUND OF FEEDBACK

See you on 26th of September