State-of-the-art (tools and analyses)

**Input**
- Research funding
- Researchers

**Conditions**
- Research policy (strategies)
- Research conditions

**Output**
- Bibliometry
- Final reports (other outputs)

**Evaluation**
- Foresight

**Intelligent analyses**
- Recommendations
1) **Aim** – Joint strategy development – emerging themes with overarching scientific relevance for actors in Europe

2) **Data to perform foresight in an informed way**
   1) Input (money and researchers) and output data (indicators of performance wider than bibliometry) with relevant classifications
   2) Conditions for research and researchers
   3) Policy documents (strategies)

3) **Organising data in Europe?**
   1) Recommendations for common funding/output databases?
   2) Common structures for horizon scanning?

4) **Foresight methods for performing intelligent interpretation of data**
Foresight to address grand challenges?

• increased complexity, uncertainty, unpredictability sharpens the need for flexible knowledge
• Need for long-term priorities and strategies
• Need for continuous strategic dialogue between stakeholders
Different foci in foresight

<table>
<thead>
<tr>
<th>Goal</th>
<th>R&amp;D focus</th>
<th>Techno-econ focus</th>
<th>Society-econ focus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>•Identify R&amp;D priorities</td>
<td>•Identify research topics relevant for different sectors</td>
<td>•Identify research topics to address societal challenges</td>
</tr>
</tbody>
</table>
|      | •National prestige  
•High quality research – international focus | •Increase competitiveness  
•Address market failure  
•Strengthen collaboration science-industry | •Contribute to increased quality of life  
•Address system failure  
•Strengthen national innovation |
|      | •researchers  
•policymakers  
•ministries | •industry  
•researchers  
•policymakers | •policymakers  
•other stakeholders  
•researchers  
•industry |
Trends in use of methods

- Quantitative → qualitative
- Analytic → creative
- Normative vs. explorative
- One-dimensional → complex
- Expert based → broad participation
- Trend extrapolation → alternative futures
- One time exercise → continuity

Methods and techniques complement each other
A typology

<table>
<thead>
<tr>
<th>Topics</th>
<th>Knowledge</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Lack of explicit knowledge</td>
<td>• Follow-up activities needed</td>
</tr>
<tr>
<td></td>
<td>• Lack of knowledge about consequences</td>
<td>• New policy orientation needed</td>
</tr>
<tr>
<td></td>
<td>• Unclear conflict structure</td>
<td>• New forks of governance needed</td>
</tr>
<tr>
<td></td>
<td>• Lack of self reflection</td>
<td>• Need for a broad societal debate</td>
</tr>
<tr>
<td></td>
<td>• Actors in a lock-in situation</td>
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</tbody>
</table>
### Different activities – relevant foresight methods

**ForSociety tool-kit**

#### Dimensions

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Opinions</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevance Trees</td>
<td>Consensus conference</td>
<td>Expert panels</td>
</tr>
<tr>
<td>Expert panels</td>
<td>S&amp;T Roadmapping</td>
<td>Backcasting</td>
</tr>
<tr>
<td>Delphi</td>
<td>Horizon scanning</td>
<td></td>
</tr>
<tr>
<td>Critical &amp; Key Technologies</td>
<td>STEEPV</td>
<td></td>
</tr>
<tr>
<td>Cross impact analysis</td>
<td>SWOT</td>
<td></td>
</tr>
<tr>
<td>Structural analysis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Topic

**Scenarios**

- Agent modelling
- Stakeholder panels
- Gaming
- Science theatre
- Citizen hearing
- Creativity methods
- Scenario workshop
- S&T Roadmapping
- Backcasting

#### Social processes

- Discourse Analysis
- Polling

#### Policy

- Multi-Criteria Analysis
Stimulate the dialogue between science and society to address grand challenges

• Use different ESF Forward looks systemically and across disciplines and topics
• Involvement of different actors of society, not only experts in different fields
  – Involvement of decision makers
• Participation in all phases of the research process – relevant strategies for involvement