



---

# Introduction into the self assessment tool on SB

*Dr. Sibylle Gaisser,  
Fraunhofer Institute for Systems and Innovation Research,  
Karlsruhe, Germany*

---

1

Dr. Sibylle Gaisser



**Fraunhofer**  
Institute  
Systems and  
Innovation Research





## Aim of the Assessment Tool

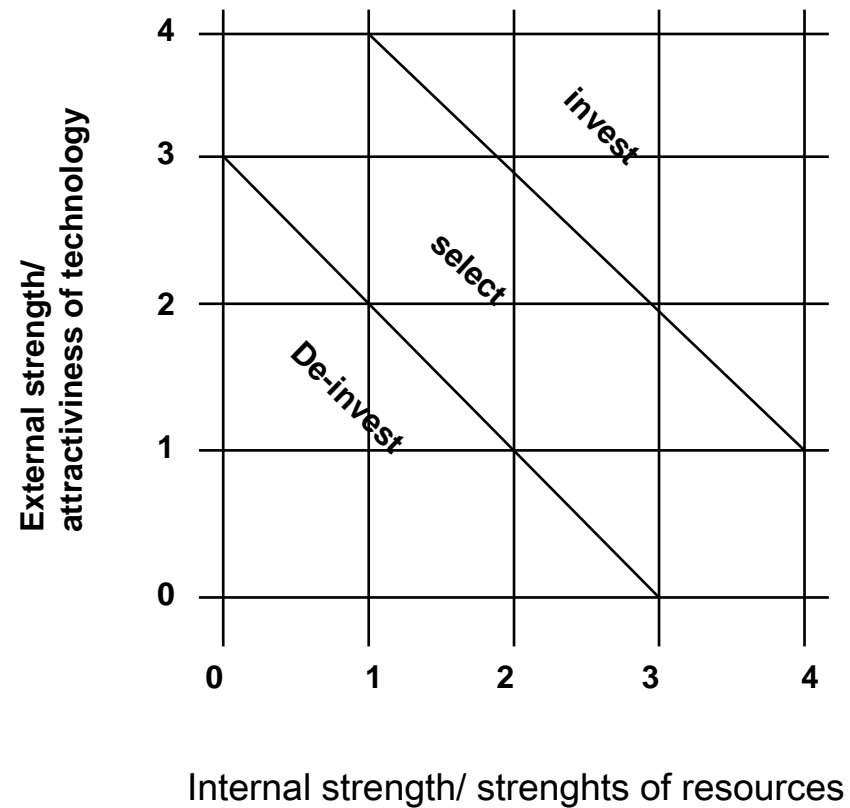


1. List a set of indicators to illustrate the fields that have an impact on Synthetic Biology and/or are impacted by Synthetic Biology .
2. Help to collect all necessary data. Identify data requirements.
3. Help to establish a rational basis for decision-making on future funding.
4. Increase transparency in decision-making.





# Assessment of SB investment modalities





## Excel spreadsheet to facilitate answering



criteria	facts and numbers	assessment (good=4, fair=2, bad=0)	<i>Internal Strength</i>
<b>Internal Organizational Structure</b>			
number of units involved in funding activities (3 units and more = 4; 2 units = 2; 1 unit = 0)			
level of coordination among units (coordinating body between units established = 4, informal contacts between units = 2, no coordination =0)			





## Assessing the internal resources



<b>Assessment of internal resources</b>	<b>assessment</b>	<b>weight factor</b>	<b>weighted assessment</b>
Internal Organisational Structure		<b>1,00</b>	
budget		<b>1,00</b>	
Internal strategic focus (disciplines/challenges)		<b>1,00</b>	
timing		<b>1,00</b>	
Internal Funding Programmes with potential link to Synthetic Biology		<b>1,00</b>	
<b>overall internal strengths</b>		<b>1,00</b>	





## Indicators for internal assessment (I)



<b>Internal Organisational Structure</b>
number of units involved in funding activities (3 units and more = 4; 2 units = 2; 1 unit = 0)
level of coordination among units (coordinating body between units established = 4, informal contacts between units = 2, no coordination =0)
Degree of inter-disciplinarity within the group (high=4, medium=2, low=0)
possibilities for joined activities (high=4, medium=2, low=0)
persons per unit
critical mass in personnel for new activities (good = 4; fair = 2, small = 0)
flexibility and freedom in strategic positioning (good=4, fair=2, bad=0)
units/persons to be involved in strategic planning
<b>budget and instruments</b>
available amount for research funding (k€)
available amount for emerging technology funding (k€)
available amount for funding of ELSI issues (k€)
average project duration (months)
average budget per project
autonomy in design of funding instruments (high=4, fair=2, low=0)





## Indicators for internal assessment (II)



<b>Internal strategic focus (disciplines/challenges)</b>
overall strategy (SB fits well in overall strategy = 4, fair fit in overall strategy = 2, no fit in overall strategy = 0)
temporary tasks (easily achievable = 4, fair = 2, not possible = 0)
<b>timing</b>
required time for program elaboration (quick response to new trends = 4, fair response = 2, long planning perspective = 0)





## Indicators for internal assessment (III)



assessment criteria	availability of funding programs	financial resources	availability of personnel	availability of related infrastructure (e.g. databases)
	good=4, medium=2, low=0	high=4, medium=2, low = 0	good=4, medium=2, low=0	good=4, medium=2, low=0
<b>Internal Funding Programmes with potential link to Synthetic Biology</b>				
Currently funded programmes in Biology				
Currently funded programmes in Chemistry				
Currently funded programmes in Computer Sciences				
Currently funded programmes in Physics				
Currently funded programmes in Engineering				
Currently funded programmes in Material Sciences				
Currently funded programmes in Social Sciences				
Current funding programmes (others)				





# Assessing the technology attractiveness



Assessment of external impact	assessment	weight factor	weighted assessment
Framework conditions		1,00	
Number of research groups in country XXX with interest in SB related topics		1,00	
Other funding organizations		1,00	
SB related thematic trends in country XXX absolute (good = 4; fair = 2; bad = 0)		1,00	
SB related thematic trends in country XXX in comparison to leading countries in SB e.g. USA) (Better = 4; same = 2; worse = 0)		1,00	
Maturity of Synthetic Biology Research and development		1,00	
impact on economy		1,00	
<b>overall external strength</b>		<b>1,00</b>	





## Indicators for external assessment (I)



<b>Framework conditions</b>
national and international regulations for SB research available (yes, cover all aspects = 4, partially = 2, no = 0)
weaknesses in regulation (not relevant = 4, impacts research slightly = 2, impacts research strongly = 0)
availability of SB infrastructures (e.g. databases, repositories)
societal acceptance of SB products in general (good = 4, fair = 2, bad = 0)
societal acceptance of SB products of medicinal applications (good = 4, fair = 2, bad = 0)
societal acceptance of SB products in energy applications (good = 4, fair = 2, bad = 0)
societal acceptance of SB products in environmental applications (good = 4, fair = 2, bad = 0)
societal acceptance of SB products in agricultural applications (good = 4, fair = 2, bad = 0)
<b>Number of research groups in country XXX with interest in SB related research</b>
Synthetic Biology
Biotechnology in general
Computer Science
Material Science
Physics
Chemistry
Biology in general
Social science with respect to risk assessment, bioethics etc.
Law (with respect to IP issues)



## Indicators for external assessment (II)



<b>Other funding organisations</b>
Number of other funding organisations (list name and address if possible)
Cooperation with other funding organisations (easily achievable = 4, fair = 2, difficult = 0)
Funding focus of other funding organisations
<b>Thematic trends in country XXX absolute (size of community good = 4; fair = 2; bad = 0) and in comparison to global trend or leading countries in SB (e.g. USA)</b>
biosensors
biomaterials
biofuels
bioenergy
diagnostics
therapeutics - vaccines
therapeutics - drugs
bioremediation
food ingredients
fine chemicals





## Indicators for external assessment (III)



<b>Maturity of Synthetic Biology Research and development</b>
prototypes available (characterize)
products available (characterize)
publications in country XXX absolute in SB
publications in country XXX in comparison to major competitors (e.g. USA)
patents in synthetic biology products and applications in country XXX
patents in synthetic biology products and applications in country XXX in comparison to major competitors (e.g. USA)
<b>impact on economy and environment</b>
employees in biotechnology industry in country XXX absolute
employees in biotechnology industry in country XXX in comparison to major competitors (e.g. USA)
number of SB companies in country XXX
number of SB companies in country XXX in comparison to major competitors
expected impact on environment

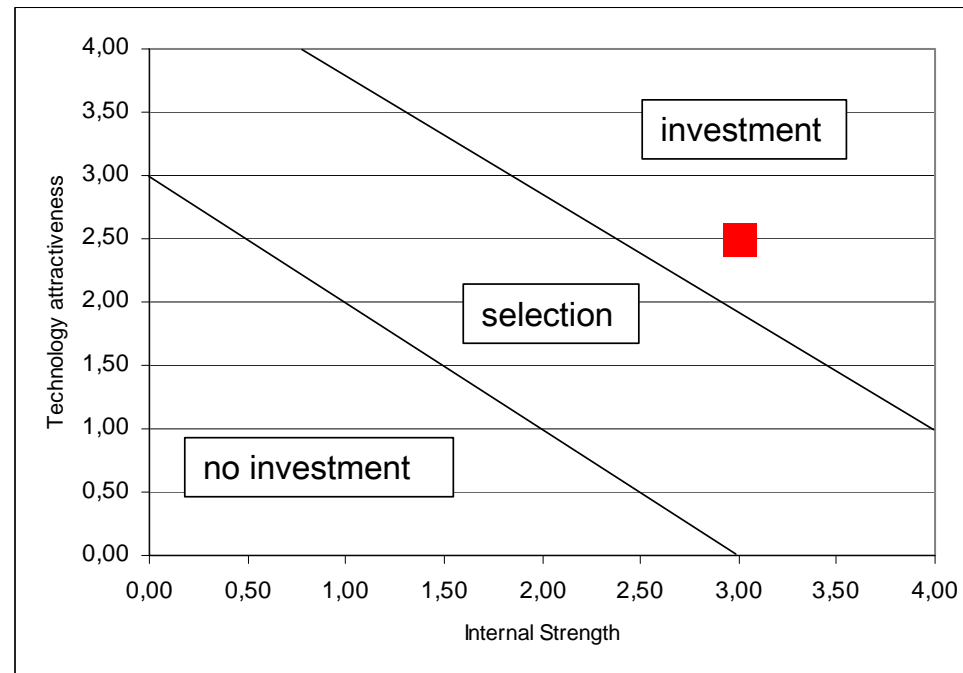




# Overall assessment



Internal strength		external strength	
total			total

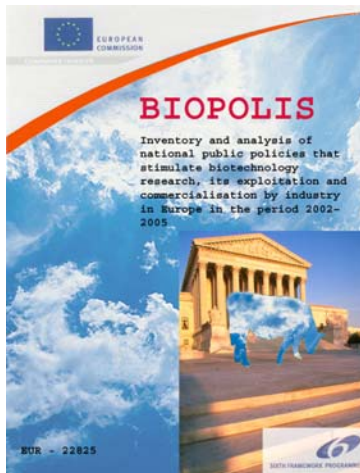




## Sources of Information (I)



- A) Internal strengths -> own analysis
- B) External strengths
  - Database on synthetic biology: <http://www.synthetic-biology.info/> allows search by bibliography, concepts, authors, and institutions
  - Biopolis: "Inventory and analysis of national public policies that stimulate biotechnology research,...":  
[http://ec.europa.eu/research/biosociety/library/brochures\\_reports-biopolis\\_en.htm](http://ec.europa.eu/research/biosociety/library/brochures_reports-biopolis_en.htm)



-> gathers available data on public biotechnology R&D funding and policy performance in 32 European countries.





## Sources of Information (II)



### B) External strengths

#### ➤ Bio4EU:

Following a request of the European Parliament an assessment of modern biotechnology (red, green, white applications) was carried out.

Results for a main report, case studies on applications and data tables.

Task 2 summarizes these reports: <http://bio4eu.jrc.ec.europa.eu/documents.html>

#### ➤ Europe INNOVA: The network driving European innovation

a) Innovation Watch: Sector report on Biotechnology

b) Innovation Panels: 5 rounds with reports that also cover Biotechnology

<http://www.europe-innova.org/index.jsp>

