



North Sea STAR Spreading Transnational Results

Annex B: ***North Sea STAR Energy Policy Scenarios***

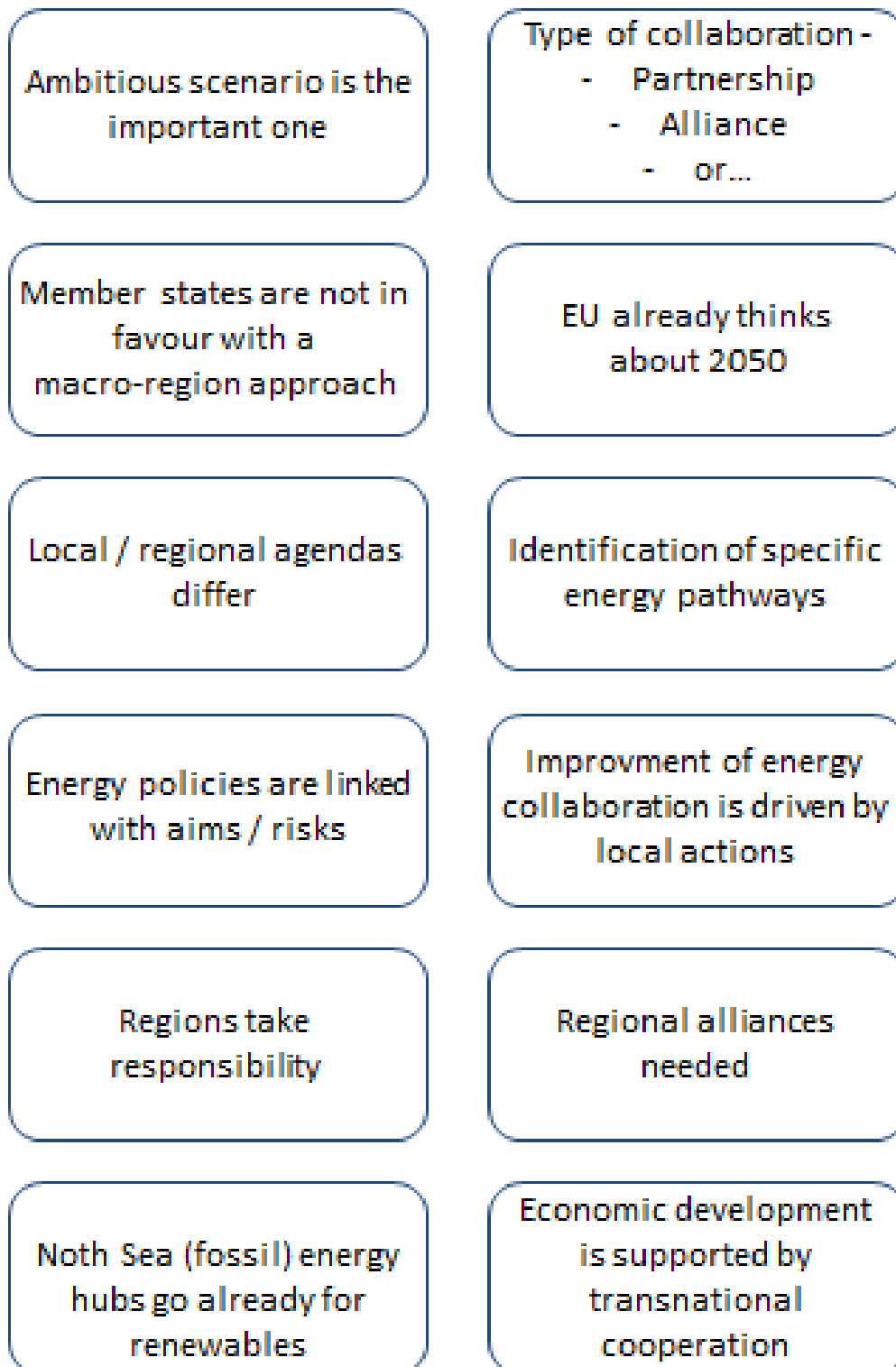
Documentation of results, discussions and interaction with participants at North Sea STAR Stakeholder Workshop, Delft, 16th September 2013

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A. Further relevant aspects in scenario building based on the proposed three 'North Sea STAR energy policy scenarios'



B. Participant's feed-back on strengths and weaknesses of the North Sea Region and some of its sub-regions in relation to the criteria of the 'North Sea STAR energy policy scenarios'

Evaluation Framework

National and sub-national perspectives on the future North Sea energy landscape

Respondent 1

Nation or sub-national region under consideration: **North Sea Region**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	decentral + central, renewable local, transport grid	no adjusted grids, no cooperation, overcapacity	<- To avoid this cooperation on bigger scale, than bilateral demand production larger scale
Energy consumption	<i>Energy consumption</i>	fulfils needs	overconsumption capacity	awareness, more sharing in industry benefit strength, minimise weakness storage
Energy efficiency	<i>Potential and realised energy efficiency</i>	less production		Awareness, financial means, isolation
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>	market	high energy costs	more transparency
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	Innovation, new markets	Takes times, financial means, human capital/interest	Dialogue, cooperation in region
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>	cooperation	competition no clear goals	goals, transnational platform, vision

Respondent 1 (North Sea Region) Continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	no stakeholder engagement, transparency, flexible	slow or now implementation	flexible transparency learning from each other, dialogue
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>	cross-border stakeholder engagement	Unclear changing fluctuating policy	goals and hold them in dialogue
Economic development and markets	<i>Developments and events on the global and EU market</i>			flexible
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>			
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>			dialogue transparency educated people

Respondent 2

Nation or sub-national region under consideration: **the Netherlands**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	Wind, Sea/Tidal energy, Shale gas	Space	
Energy consumption	<i>Energy consumption</i>			Greenhouses
Energy efficiency	<i>Potential and realised energy efficiency</i>	Cycling		
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>			
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>			
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>			
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>		Car based development	

Respondent 2 (the Netherlands) continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>			
Economic development and markets	<i>Developments and events on the global and EU market</i>	use crisis to re-focus on renewable energy		
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>	Know-how-flood management		
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>			

Respondent 3

Nation or sub-national region under consideration: **United Kingdom**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	Wind /shale gas	Local production externalities national usage	Local action for major infrastructure
Energy consumption	<i>Energy consumption</i>	Gradual energy efficiency measures	Cost of retrofitting introducing new energy efficiency compared with payback	
Energy efficiency	<i>Potential and realised energy efficiency</i>	Energy efficiency programs	Cost effectiveness, payback period, technology providers	Clear incentive subsidies to drive the process
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>	With national variation	Sometimes in industry efficiency conversely drives up cost Fuel poverty	
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	Often untested in the market	Integration in the system and cost of connecting by grid	
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>	Private sector investors	Societal concerns private profit for public good	Balance cost, subsidy, profit
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>		Fuel poverty	

Respondent 3 (United Kingdom) continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>		Inconsistency of messages from the national government about political priorities Economic vs. environment	Connecting political expectancy and challenge
Economic development and markets	<i>Developments and events on the global and EU market</i>	Concerns regarding costs of energy inputs (fossil fuels, gas oil etc.)	Concerns regarding the extent at which new energy remains within costs	
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>		Not yet - but longer term memories	
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>	Knowledge of age of infrastructure and need for renewables	Confused private sector	

Respondent 4

Nation or sub-national region under consideration: **North Sea Region**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	High share renewables of energy production, research and producers of technology	Enablers, investors	Innovation in technologies high level of investment
Energy consumption	<i>Energy consumption</i>	Awareness to ?? consumption	A lot energy is produce when it is not needed	Storage, smart grids
Energy efficiency	<i>Potential and realised energy efficiency</i>	Awareness in the sector building and business as a potential		Innovation in technologies, awareness, ??
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>		In-transparent price setting	Awareness of external costs -> transparency
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	Renewables as part of the innovation agenda	Taking risks	Risk schemes, consistent policies
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>			
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	Private households as major investors	Decentralisation	Stable investment frameworks

Respondent 4 (North Sea Region) continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>	European goals as minimum denominator	Renewables in competition to traditional energy production	Support technological transition
Economic development and markets	<i>Developments and events on the global and EU market</i>	NSR as world teacher in renewables technologies	Supporter	Keep and improve status
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>			
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>			

Respondent 5

Nation or sub-national region under consideration: **England**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	Broad base / diversity of sources – renewable, fossils, nuclear	Growth of renewables not fast enough	
Energy consumption	<i>Energy consumption</i>	Not sure! Consumption remains high		Probably greatest scope for change in transport sector
Energy efficiency	<i>Potential and realised energy efficiency</i>	Improving in domestic sector (Green Deal) and public buildings/new buildings	Still need to increase efficiency in industrial sector	
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>		Increasing costs for all	Cheaper energy
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	Interesting collaborations between universities and private sector	High capital costs for implementing new technologies	Finance for pilot projects and more supportive planning systems
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>	Main collaboration between national government + private sector		Greater public understanding of energy policy and involvement in areas besides pricing
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	Economic crisis / rising energy prices forcing new behaviours e.g. reduced car use	Still little understanding of some new technologies and their impacts, e.g. shale gas	

Respondent 5 (England) continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>	Most interaction at national-EU or national-regional level. National policy takes precedence	Little local authority involvement in energy decisions and planning	
Economic development and markets	<i>Developments and events on the global and EU market</i>	Reasonably well placed to absorb “shocks” in market		
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>	Risk of coastal flood/erosion encouraging thinking about mitigation/adaptation	Some infrastructures still vulnerable	
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>	Availability of skilled workers on par with pace of renewable development		

Respondent 6

Nation or sub-national region under consideration: **The Netherlands**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>			
Energy consumption	<i>Energy consumption</i>			
Energy efficiency	<i>Potential and realised energy efficiency</i>			
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>			
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	→ "Remarks"		
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>			
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	Exporting electricity to the grid		- fiscal incentives - regulations fit to this (in law)

Respondent 6 (the Netherlands) continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>			
Economic development and markets	<i>Developments and events on the global and EU market</i>			
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>			
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>			

Additional Remarks

Criterion of technological innovation	Indicator	Assets	Needs
Commercial effects of clean technology	Skilled people	SME potential in NSR	Skilled human capital 'green skills'
Commercialising : energy efficient & production sectors	SME that start exporting	SME potential in NSR	Finances for demonstration (up-scaling from prototype to market)

Respondent 7

Nation or sub-national region under consideration: **United Kingdom**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	Oil + gas reservoirs, wind and wave, tidal potential, shale gas, reservoirs, new technology to get more ?? old oil and gas fields	Shifting political commitment to renewable energy production e.g. feed in tariffs	New focus to support renewable energy sector
Energy consumption	<i>Energy consumption</i>	General- household consumption + energy efficiency mirrored by increasing focus of energy efficiency issues in supply chains	Perhaps reducing cost of fossil fuels	New alignment of cost saving + reducing energy consumption
Energy efficiency	<i>Potential and realised energy efficiency</i>	increasingly cost con?? public sector + general public, falling household income / disposable income	Capital costs of energy efficiency/renewable energy technologies + payback period challenges, organisation of more efficient supply chains	Finance in initiatives to and investment Organisational initiatives to realise energy efficiency savings in supply chains
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>	Potentially fall oil/gas prices associated with new technologies/supply Cost sensitive society/business	High cost of renewable energy alternatives	Consistency in support for renewable energy options
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	New technologies perhaps most influential in relation to oil + gas	Renewable energy technologies except wind ?? what early stage of development	Sustained investment in bringing forward reliable renewable energy technology to counterbalance fracturing + oil/gas field pumping technologies
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>	Increased international co-operation on energy grids some local level commitment to leading the field	Difficulty in resourcing local level initiatives in this area due to local government budget cuts etc.	Support to encourage local action framework to assist international Collaboration relation to large infrastructure projects

Respondent 7 (United Kingdom) Continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	Younger generation more likely to be supportive environmental awareness/lower disposable incomes + growing elderly population with resource challenges	Potential falling oil and gas prices may reduce social and political interest in agenda	Potential differential to getting of different groups to reflect their different motivation
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>	Need for international co-operation, increasingly recognized, but EU lead challenged	Local level responsibility and commitment determination and political commitment to take steps forward	Support for local level action would be beneficial
Economic development and markets	<i>Developments and events on the global and EU market</i>	Energy issues key in debating competitiveness, efficiency as well as new renewable sectors seen as areas of growth potential	concerns about fossil fuel reserves, potentially reducing interest in these areas	Links to the competitiveness and growth need to be drawn out
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>	Periodic flooding and unusual climatic events,	Links between climate change and energy issues	Ongoing awareness raising societal learning programs
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>	NGO activating but a little polemic	Local government capacity in this area reducing	Support for NGO / local government awareness raising projects

Respondent 8

Nation or sub-national region under consideration: **Scotland**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	Large potential in terms of wind, hydro + marine energy	- Public sector investment needs to stimulate more private sector activity, - research in marine sector	- Smart grids - Training in renewable energy . Research into marine energy - Public awareness
Energy consumption	<i>Energy consumption</i>	Large reserves for renewables	Raising consumption looming energy crisis	Measures to reduce to energy consumption this energy efficiency
Energy efficiency	<i>Potential and realised energy efficiency</i>	Energy efficiency seen as important part of mix	Large numbers of households not energy efficiency	Greater investment in retro-fitting
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>	Many sites for renewable energy generation	Much energy produced away from large centres of population, European gas prices cause problems	Changes in regulating approach of UK Government moves towards EU energy market – North Sea Grid
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	Significant base for technologies innovation	- Fragmented market - large no of SMEs - venture capital needs	Transnational co-operation in new supply chains/products/processes great need for energy strategies
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>	Political + government commitment to renewables	Lack of public acceptance	Greater public acceptance + community involvement

Respondent 8 (Scotland) Continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	Public acceptance stronger in under 35s. government incentives in biomass and solar panels effective	Public acceptance weaker in over 35s	Awareness campaigns for over 35s Widening of Government incentives to introduce domestic and industrial energy efficiency and renewable generation
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local) Role and responsibility of the different policy levels</i>	EU sets ambitious targets for 2020. Many useful policy initiatives at national, regional and local levels	Lack of long term targets at EU level for 2030/2050 leads to uncertainty in large projects	Member States to agree 2030/2050 targets
Economic development and markets	<i>Developments and events on the global and EU market</i>	Scottish Government has ?? economic potential for renewables, more jobs and experts	Taking new products, ?? and services to commercialization	Greater public investment in training and new technologies
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>	Greater awareness of climate change	Still significant members and elements in government that dispute climate change Climate change slipping down political agenda	More mitigation measures, Pushing climate change up the political agenda
Social learning	<i>Status of public awareness and knowledge, availability of skilled and trained people</i>	Many island and rural communities accenting renewables	Many sections of public against onshore wind farms	Training needs in renewable technologies shells shortages, public awareness campaigns ???

Respondent 9

Nation or sub-national region under consideration: **The Netherlands**

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Energy production	<i>Potential and realised energy production</i>	Delta Gas Wind Coast (Harbours)	Tradition with fossils	Breakthrough – new sources
Energy consumption	<i>Energy consumption</i>	Density		Focused Attention
Energy efficiency	<i>Potential and realised energy efficiency</i>	Growing attention		
Energy costs	<i>Costs for different types of energy per energy source and for consumer</i>		Depends on uses (for example, agriculture)	
Technological innovation	<i>Availability of reliable and efficient technologies for production, use and energy savings</i>	Water and delta technologies	Tradition blocks innovation	
Decisive societal partners	<i>Level of collaboration of the societal partners in energy policies</i>	Recent agreement among broad coalition	unstable	More ambition
Social changes	<i>Changes of the societies interacting with energy behaviours and policies (demographic changes, economic preferences, shifting societal baselines)</i>	NGO attention to climate change, position in the Delta	Economic crisis takes away interest	

Respondent 9 (The Netherlands) Continued

CRITERION	KEY TOPICS, INDICATORS	ASSETS	IMPAIRMENT OF ENERGY SECTOR	NEEDS
Policy making	<i>Level of interaction of the policy levels and sectors (EU, national, regional local)</i> <i>Role and responsibility of the different policy levels</i>	De-central initiatives	No consistency No drive from national level	Feeling of urgency
Economic development and markets	<i>Developments and events on the global and EU market</i>		Dependency on fossils: economy depends on it	Gas rotunde
Impacts of climate change or environmental hazards	<i>Developments and impacts of environmental processes incl. catastrophic events</i>	Flood		
Social learning	<i>Status of public awareness and knowledge,</i> <i>availability of skilled and trained people</i>	medium		

C. Priorities and clusters of the criteria of the 'North Sea STAR energy policy scenarios'

Top- ranked priorities at top

