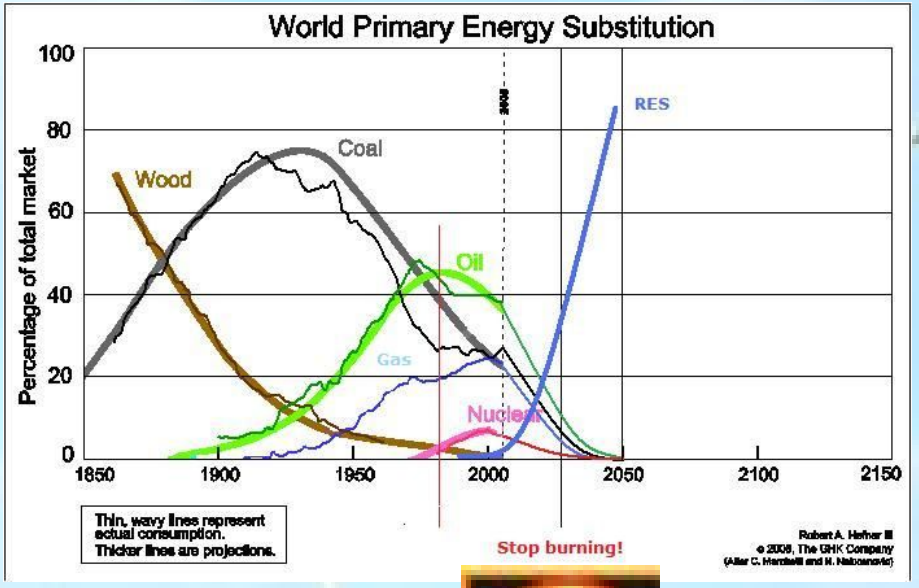
Lithuanian wind energy development trends

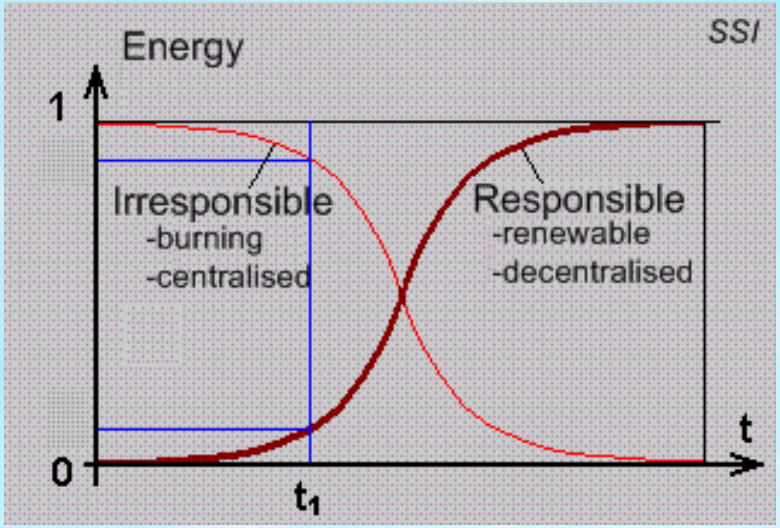
Stasys Paulauskas, Dr. Assoc. Prof.

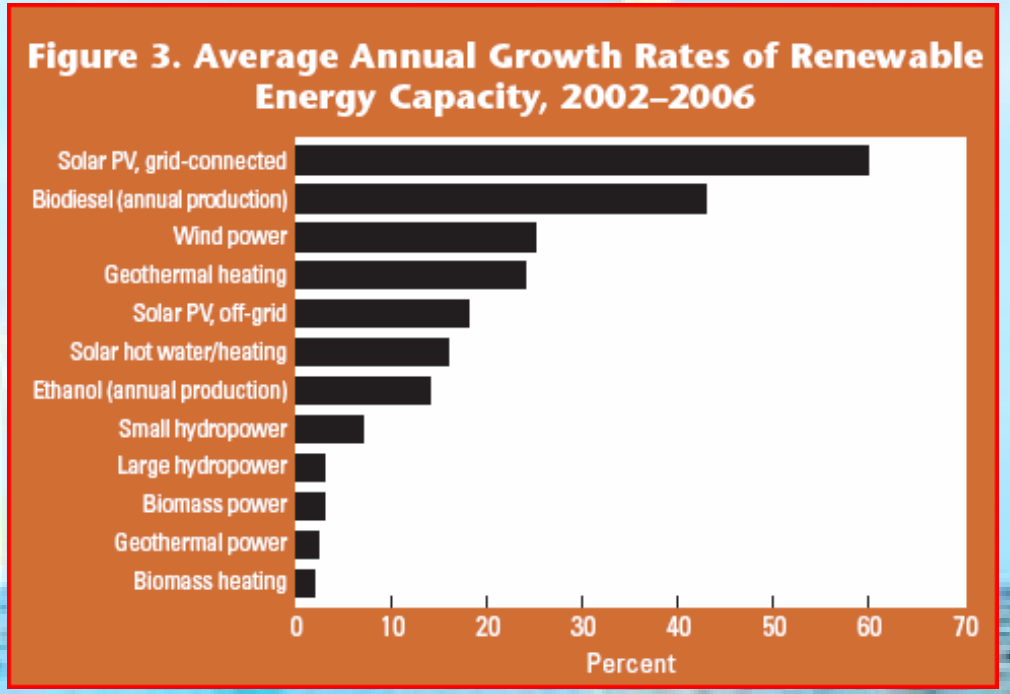
Innovations Company “Eksponente”

Energy future trends



The Future – for Responsible energy

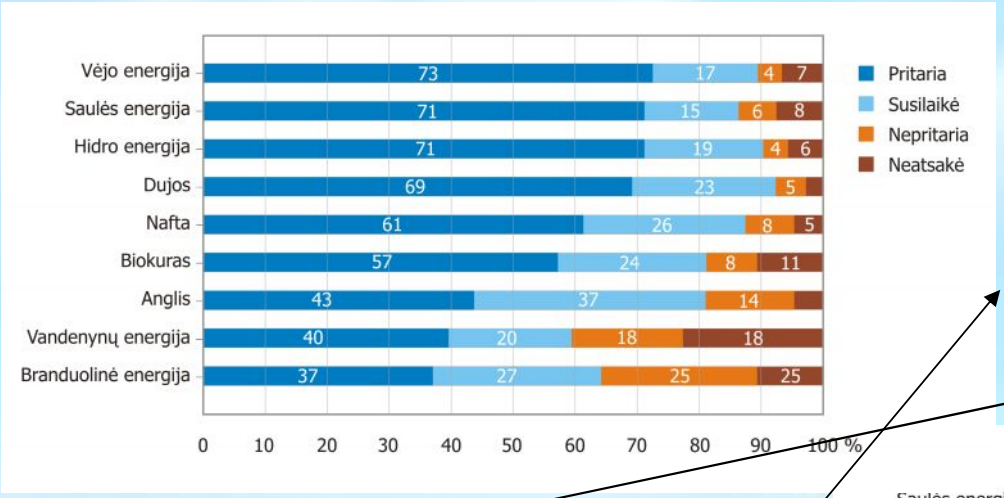




Lithuanian and EU people – for energy of sky

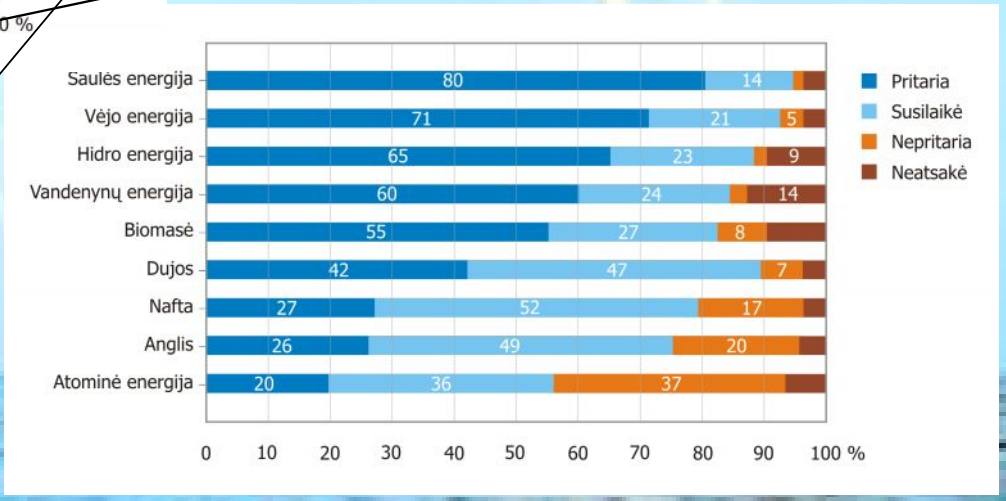
Eurobarometras, 2006

Pritariate ar ne šių skirtingų energijos išteklių panaudojimui Lietuvoje?



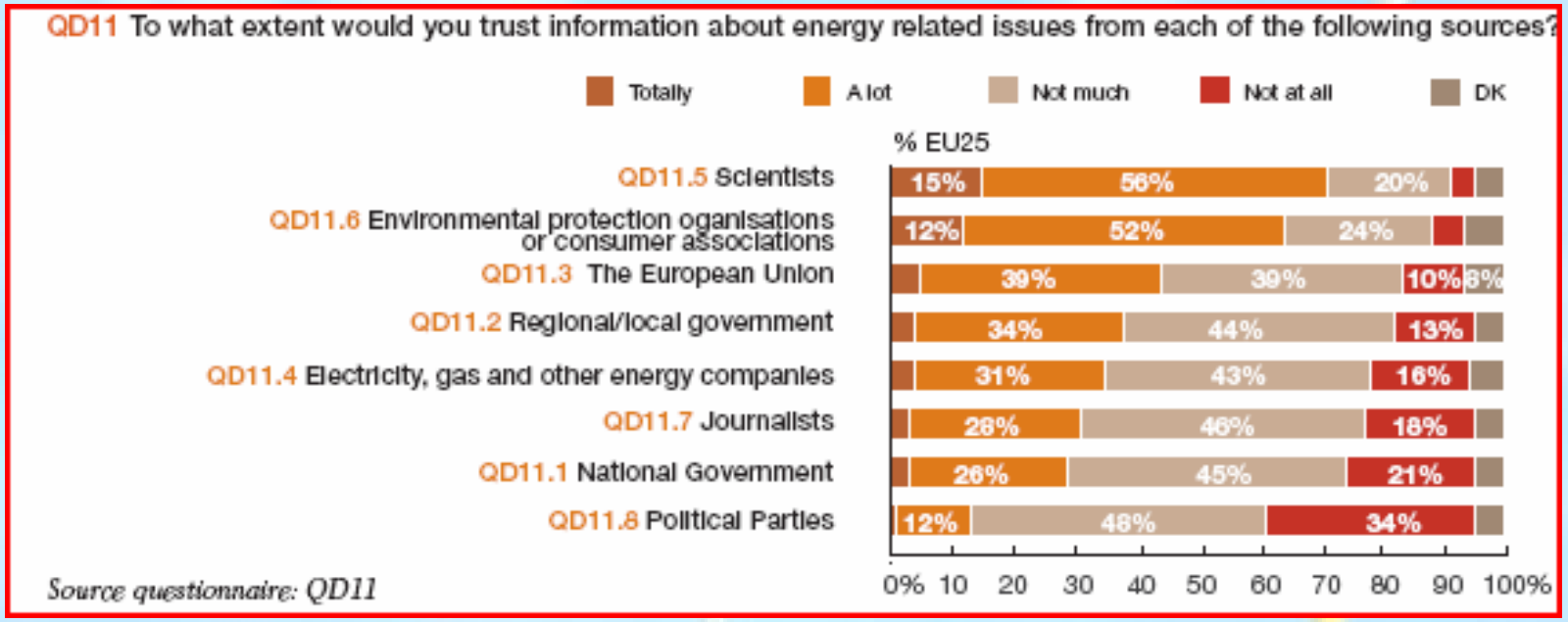
Vox populi – vox Dei!

Democracy – power of people



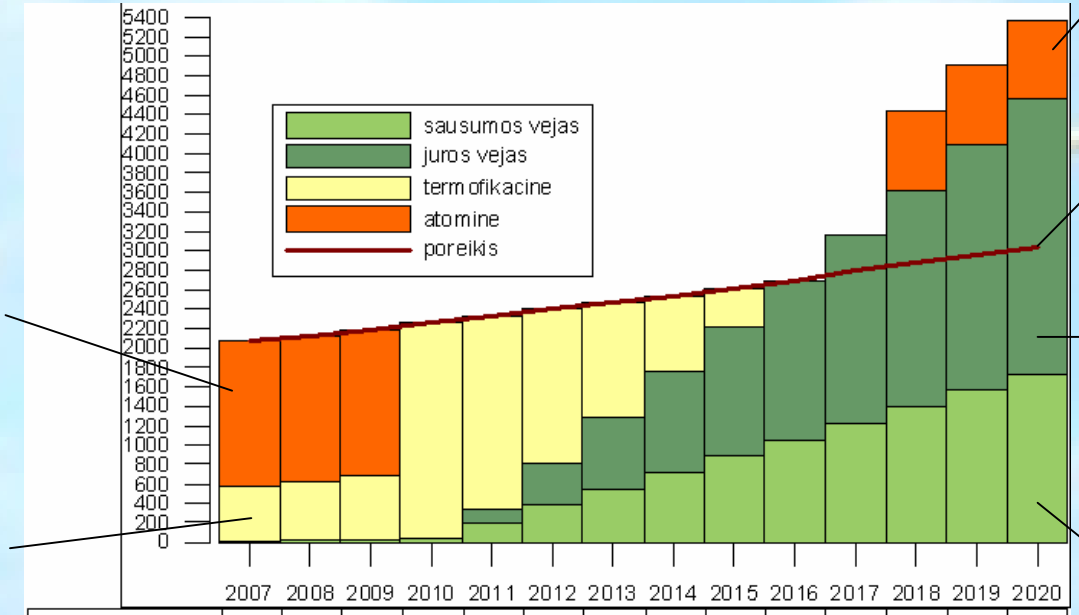
Energy trust, EU25

Eurobarometer, 2006



Ignalina NPP should be closed at end of 2009

The forecast of dynamics of needs for electricity capacity (MW)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Poreikis	2074	2125	2193	2261	2329	2397	2465	2533	2618	2703	2788	2873	2958	3043
Atominė elektrinė	1500	1500	1500	0	0	0	0	0	0	0	0	800	800	800
Termofikacinės elektr.	563	605	663	2221	1989	1587	1185	783	398	13	0			
VE - jūra					130	430	730	1030	1330	1630	1930	2230	2530	2830
VE - krantas	11	20	30	40	210	380	550	720	890	1060	1230	1400	1570	1740

New NPP

Consumption

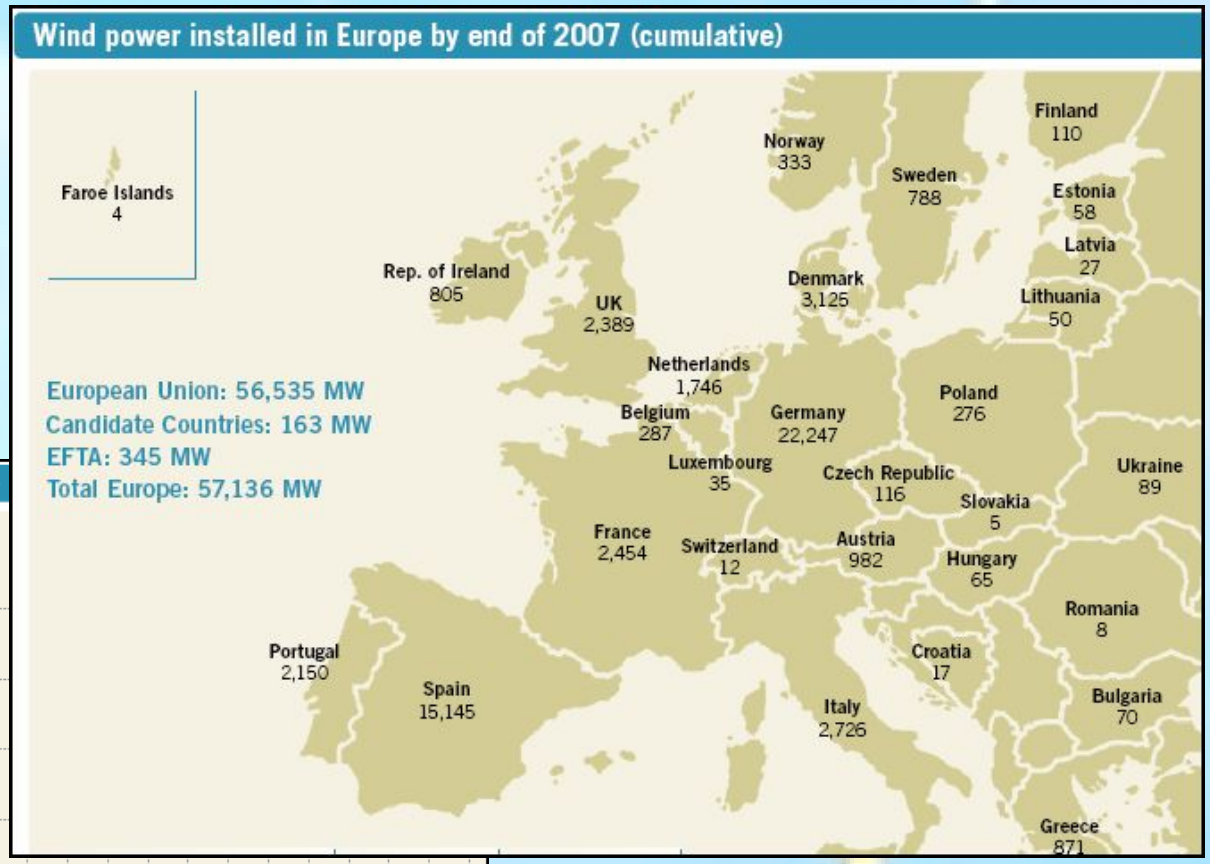
Offshore wind power

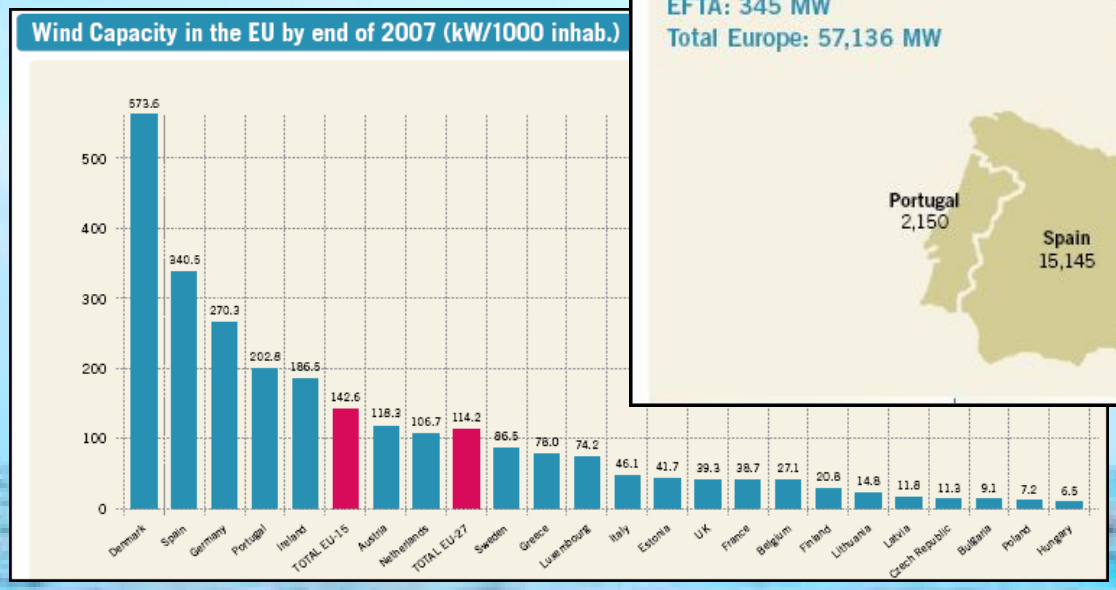
On shore wind power

Ignalina NPP

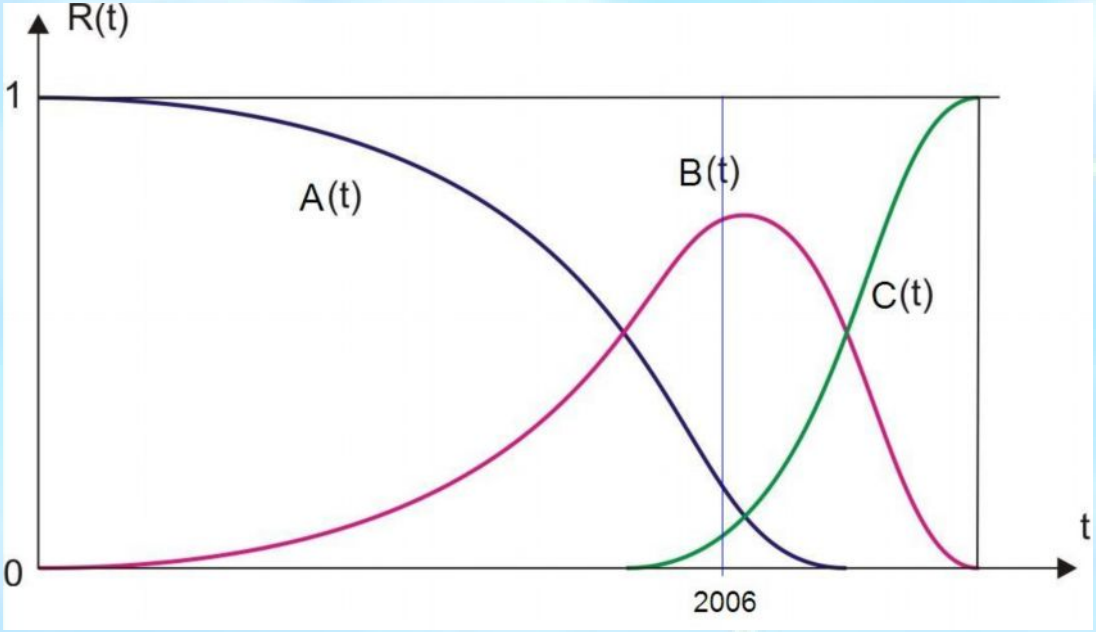
Burning of gas

Lithuanian wind power in Europe





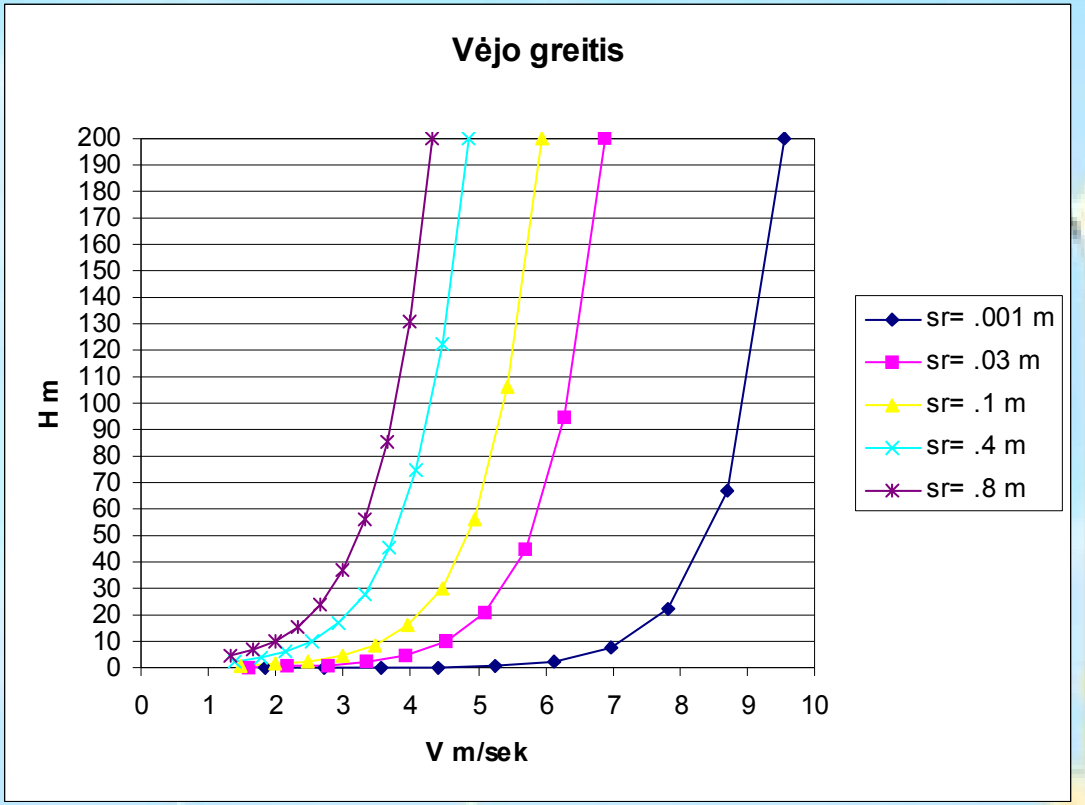
Transition of attitude to wind power



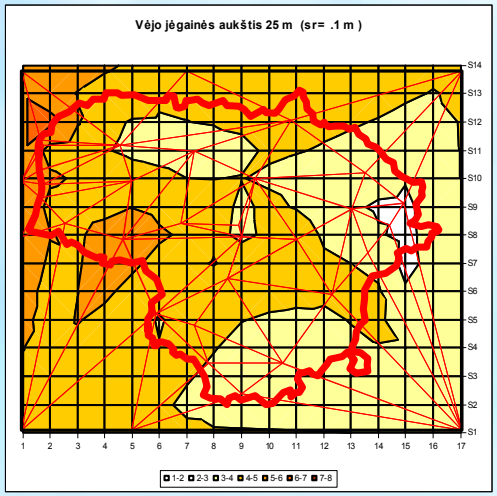
R(t)=A(t)+B(t)+C(t)

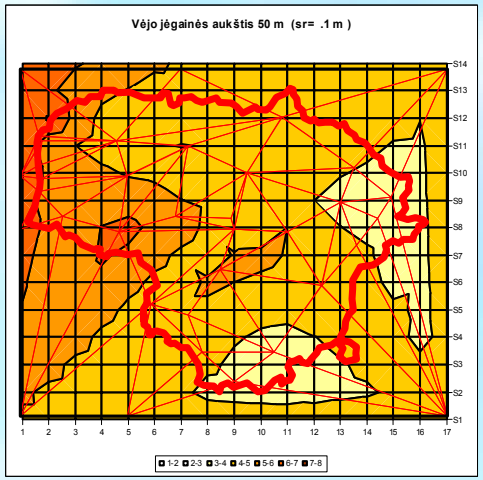
A(t) scenario of ***centralized*** energy,
B(t) quantifiable scenario of regionality**,**
C(t) qualitative scenario of decentralised development

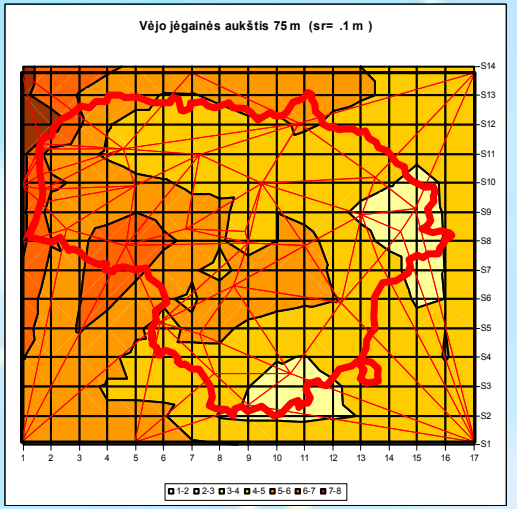
As higher as more of wind

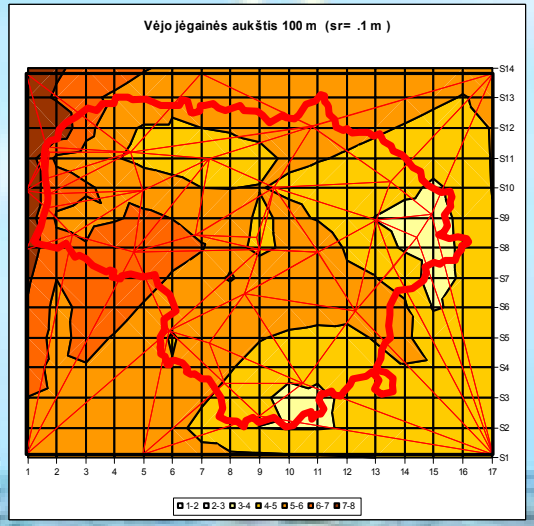


At 100 m there enough of wind in overall Lithuania









To create a wind economy branch

Scenarijus Kriterijai	Matavimo vnt.	2015
Sukurtas sektoriaus BVP	Mln.Lt.	**9605**
Sektoriaus dalis šalies BVP	%	**7,0**
Įdiegta galia	MW	**3059**
Įdiegtos galios ekvivalentas*	MW	**918**
Investicijos į vėjo elektrinių statybą	Mln.Lt.	**10554**
Pagamintos energijos kiekis	GWh	**4798**
Dalis nuo bendro pagamintos energijos kiekio	%	**35**
Užimtųjų skaičius	žmonių	**20709**
Ekologinis indikatorius	CO_2 dujų ekvivalentas, tūkst. t.	**10005**

What to do on shore

- To prepare new wind energy support program
- To remove 250 kW limit for development of wind power
- To remove requirements to change site purpose under WPS from agricultural to commercial
- To turn EU structural founds for support of installation of WPS for consumers

- Perspectives of Offshore Wind Energy development in marine areas of Lithuania, Poland and Russia

INTERREG IIIa

PROJECT DURATION: 2006.04.01 – 2008.03.31

RUSSIA, Kaliningrad district

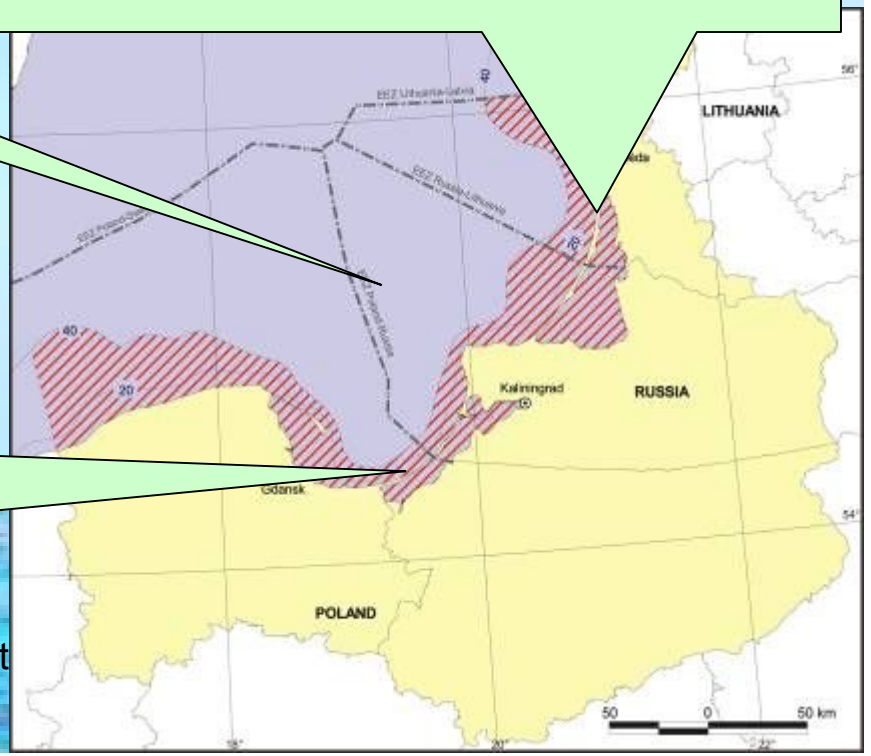
- **Atlantic Branch, Institute of Oceanology, Russian Academy of Sciences**

LITHUANIA, Klaipeda county

- **Klaipeda University, Coastal Research and Planning Institute**
- **Strategic Self-management Institute**
- **Klaipeda County Governor's Administration**

Poland, Pamorskie voivodeship

- **Maritime Institute in Gdańsk ;**
- **Maritime Office in Gdynia ;**
- **Polish Wind Energy Society**

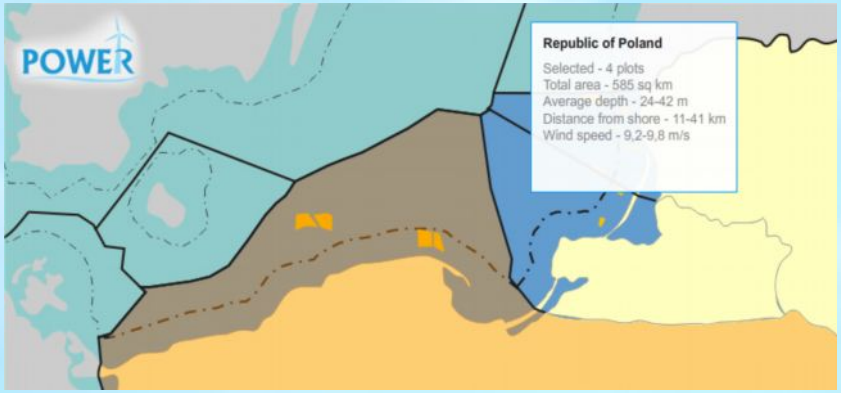


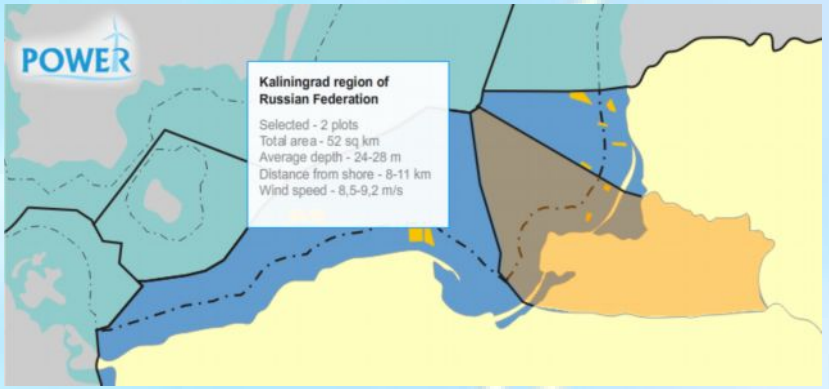
June 04, 2008

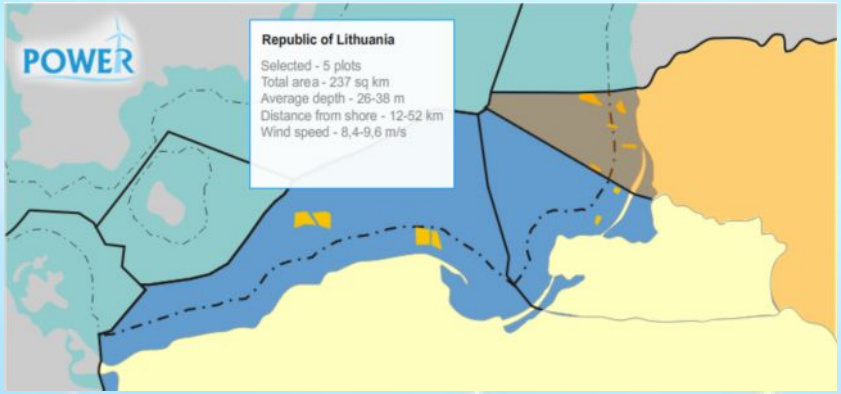
www.eksponent

11 plots in 3 countries

http://www.bosec.lt/eco

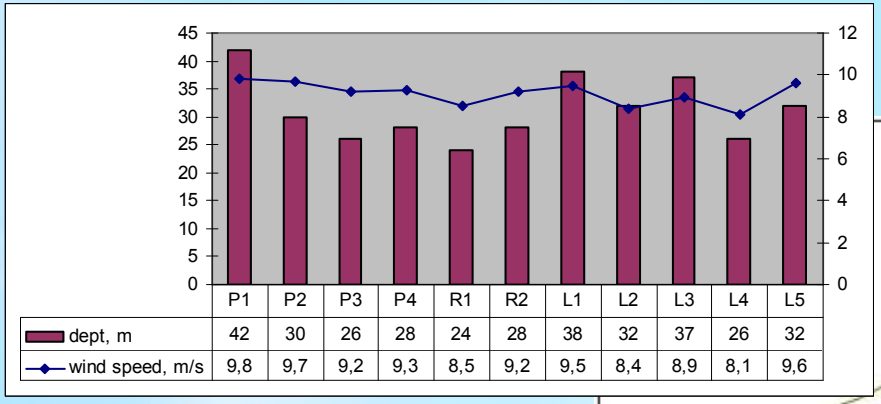




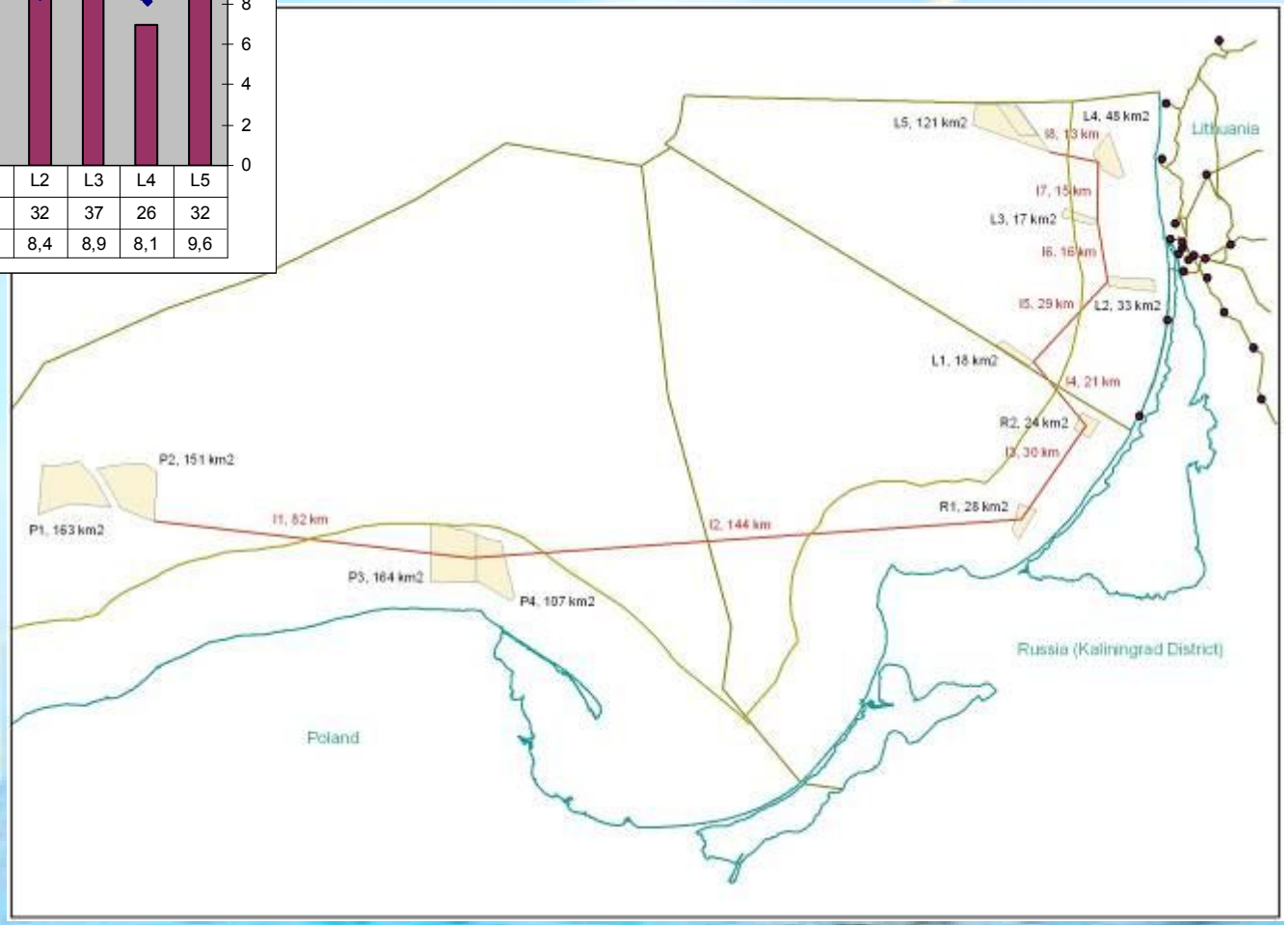


Country/			Nordex, 2.5 MW			Vestas, 3 MW			GE, 3.6 MW			RePower, 5 MW		
WP name	FID	Area, km^2	turbines	MW	M€	turbines	MW	M€	turbines	MW	M€	turbines	MW	M€
Poland		**585**	**1306**	**3265**	**6530**	**1031**	**3093**	**6186**	**772**	**2779**	**5558**	**527**	**2635**	**5270**
P1	3	163	364	910	1820	287	861	1722	215	774	1548	147	735	1470
P2	2	151	337	843	1685	266	798	1596	199	716	1433	136	680	1360
P3	1	164	366	915	1830	289	867	1734	217	781	1562	148	740	1480
P4	0	107	239	598	1195	189	567	1134	141	508	1015	96	480	960
Russia		**52**	**117**	**293**	**585**	**91**	**273**	**546**	**69**	**248**	**497**	**47**	**235**	**470**
R1	0	28	63	158	315	49	147	294	37	133	266	25	125	250
R2	1	24	54	135	270	42	126	252	32	115	230	22	110	220
Lithuania		**237**	**529**	**1323**	**2645**	**418**	**1254**	**2508**	**313**	**1127**	**2254**	**213**	**1065**	**2130**
L1	2	18	40	100	200	32	96	192	24	86	173	16	80	160
L2	4	33	74	185	370	58	174	348	44	158	317	30	150	300
L3	3	17	38	95	190	30	90	180	22	79	158	15	75	150
L4	1	48	107	268	535	85	255	510	63	227	454	43	215	430
L5	0	121	270	675	1350	213	639	1278	160	576	1152	109	545	1090
Total		**874**	**1952**	**4880**	**9760**	**1540**	**4620**	**9240**	**1154**	**4154**	**8309**	**787**	**3935**	**7870**

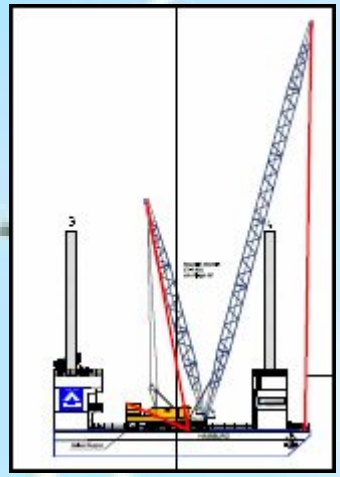
POWER: Location of wind parks
Poland, Russia (Kaliningrad region), Lithuania

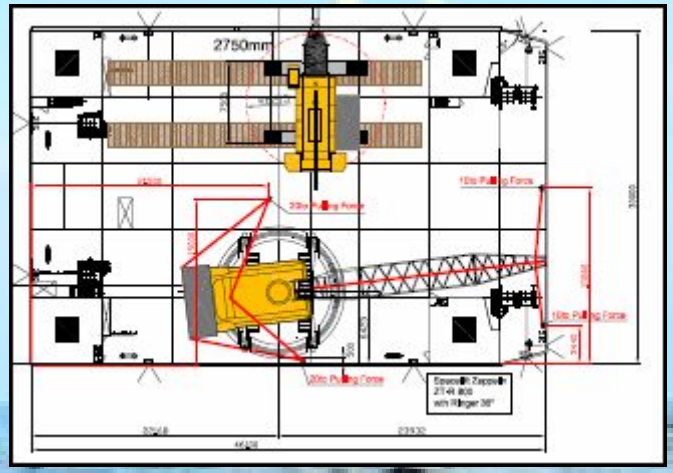


	P1	P2	P3	P4	R1	R2	L1	L2	L3	L4	L5
dept, m	42	30	26	28	24	28	38	32	37	26	32
wind speed, m/s	9,8	9,7	9,2	9,3	8,5	9,2	9,5	8,4	8,9	8,1	9,6



Made in Lithuania





Troubles for offshore wind power development

- No grids – onshore grids are weak and conservative – asks investments to grid renewing;
- Not enough of WPS producing capacities – producers don’t want to spread factories (it’s necessary to wait for supply of equipment 3-4 years.)
- Lack of Environment legislation and maritime administration experience
- National governments don’t looks serious to offshore wind power, etc.
- EU legislation still with holes

Pan European Super grid

Capacity factor of OWP:

- Stand alone →40%
- Super grid → 70%

Power market integration:

- Now - 10%
- With Super grid → 100%

To avoid disintegration

- **The biggest problem – <u>disintegrated facilities</u> of businessmen, policymakers and scientists.**
- Necessary tools for decision:
  - Policy – EU strategic and financial support
  - Organization – BOSEC establishing
  - Environment – scientific support

Baltic memorandum on responsible energy, Oslo, 2006

Let's create the future responsibly!

THE BALTIC MEMORANDUM OF RESPONSIBLE ENERGY

Oslo, May 30, 2006

We, hereunder signed representatives of Wind Energy providers of Baltic States - Estonia, Latvia and Lithuania,

bearing responsibility for sustainable and long-term supply of safe, reliable and available energy to people and enterprises,

stating that institutions of governance and self-management, science institutions and energy enterprises have achieved a lot striving to ensure stable and reliable supply of energy and rational fulfilment of energy needs,

remarking that enlargement of European Union and integration into economic structures of global market encouraged us to pay more attention to speeding up reforms in energy sector, dispose energy producing in generations which grounded on unreliable technical decisions, adopt principles of sustainable development and increase the use of renewable energy sources,

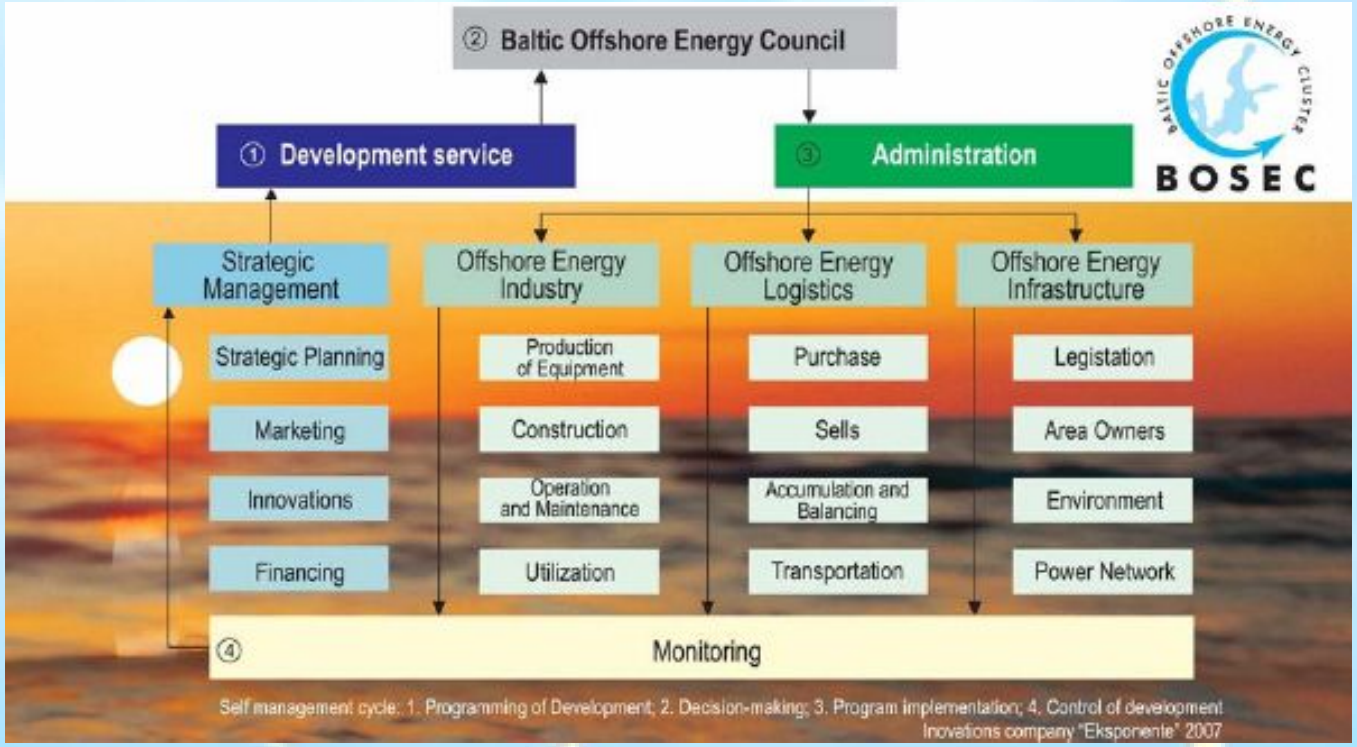
acknowledging that due to the lack of clarity in development perspectives, conventional energy conditioned imminent climate changes, rapid increase of oil and gas prices and increasing dependence on providers of these types of fuel, centralized energy system will be incapable of ensuring reliable and stable supply of energy in affordable prices, and

seeking to create favourable opportunities to provide people of European Union with safe, ecological and socially acceptable energy, **we shall undertake**:

1. Take specific actions to consistently transform dominating conventional energy system grounded on priorities of technical, production and economic growth into **responsible energy system**, in which economic, environmental and social aspects would be harmonized and directed towards ensuring long-term prosperity of people;
2. Seek to create and implement **Strategic Self-Management System of Responsible Energy of European Union**, which would be able to constantly debate, investigate, create and simulate various future scenarios of energy evaluating and basing them primarily on principles of social benefit, environmental and green accounting;
3. Support creation of energy system based on principles of **positive – renewable energy**, which would allow to provide residents, business enterprises and public institutions with the most secure and most convenient, regarding to supply and electronic regulation, form of end-use energy – electricity; We hereby would reject dangerous for environment and people nuclear power plants and constantly reduce combustion of oil, gas and other materials for water heating and energy production;
4. Support consistent reformation of centralized **electricity supply into decentralized**, as closely as possible attached to consumer, energy system, which uses wind, solar power and other sources of renewable energy; In order to flatten fluctuations of electricity consumption, the Pumped Storage Plants and other modern decisions must be adopted;
5. Guide reformation of centralized electricity transmission and distribution grid in such way that nearing of electricity production to consumers would help to create opportunities to reduce costs of electricity grid and energy prices for the end-users; In order to restore wind energy traditions of the sixteenth century, create opportunities, with regard to local and regional principle, to establish wind power plants near every town and settlement, which would be collectively funded by local self-management institutions, business enterprises and residents;
6. Seek to improve legal basis of energy in such way that this sector would be regulated by energy law written in language understandable for consumers; Renounce gas, heating, electricity and other discrete laws and statutory acts that entrench monopolistic interests of producers and energy centralization;
7. Initiate consolidation of energy enterprises and relevant institution into **Cluster of Responsible Energy of European Union**, establish **Council of Responsible Energy of EU** and departments of development and administration, and found **The Technological Platform of Responsible Energy of European Union**;
8. Guard that funds dedicated to development of energy sector and also support of the Structural Funds of the EU would be directed towards development of responsible energy, research of modern scientific decisions for energy, innovation, project implementation and enlightening of society about the issues of responsible energy;
9. Support and develop international cooperation in the field of responsible energy, initiate international projects and invite specialists of other states to foster energetic prosperity of people and preservation of environment for the current and future generations;
10. Invite all concerned institution, political parties, enterprises and establishments to join the memorandum of responsible energy.

Estonian Wind Power Association	Latvian Wind Energy Association	Lithuanian Wind Energy Association
Jaan Tepp, Chairman	Pauls Barons, President	Stasys Paulauskas, President

Synergy of business, science and policy – for responsible Baltic offshore Energy!



Members of the Initiative Group

BALTIC OFF-SHORE ENERGY CLUSTER

BOSEC

Dr. Stasys Paulauskas,
Director of JSC „Eksponente",
President of Lithuanian Wind
Energy Association

Aleksandras Paulauskas,
Director of Lithuanian Wind
Energy Association

Lithuania

Dr. Paulis Barons,
President of Latvian Wind
Energy Association

Uldis Johansons,
Executive Director of Latvian
Wind Energy Association

Aivars Upenieks,
Member of the board
in company FCM Ltd

Kaspars Mucenieks,
Company FCM Ltd

Latvia

Jaan Tepp,
President of Estonian
Wind Energy Association

Claus Vandsoe,
Vestas Northern Europe
Country Manager

Hannes Agabus,
Board Member of Estonian
Wind Power Association

Estonia

Bogdan Gutkowski,
President of Polish Wind Energy
Society,
Director of Company AOS Ltd.

Juliusz Gajewski,
Maritime Institute in Gdansk

Poland

What shows a telescope of future at 2020?

- No any nuclear power stations
- No gas burning
- Lot of wind, solar, etc. on windows, roofs,
- Low voltage home electricity net and equipment
- Intelligent home

Problems to be decided

- Transition from centralized electricity supply and pricing to decentralized
- Consumer market
- To avoid 82% of price for service of electricity grid
- To have possibility to use own generated electricity in home, to sell surplus and buy a lack
- Autonomous hybrid electricity generation using different kinds of energy
- Take part in Intelligent house…

Thanks for your attention!