



Lithuanian wind energy development trends

Stasys Paulauskas, Dr. Assoc. Prof.



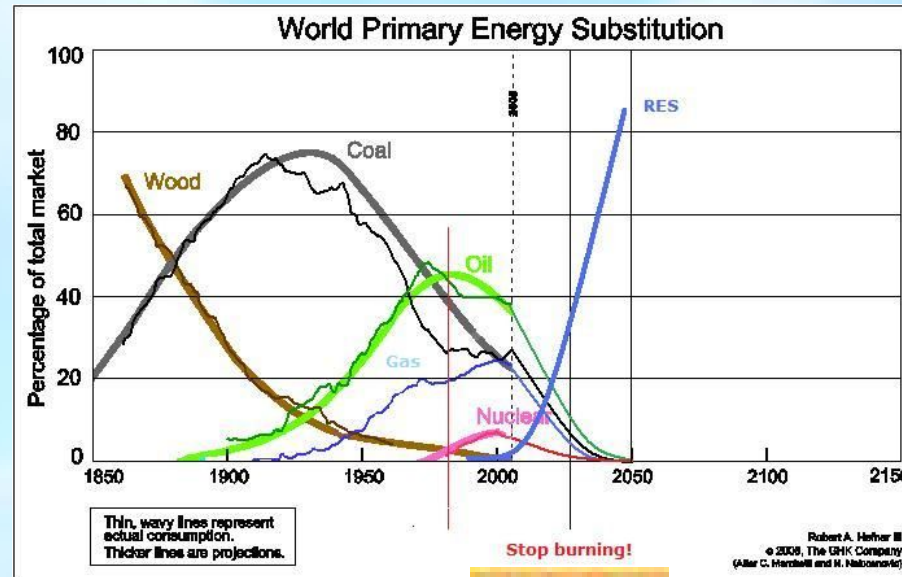
Innovations Company "EkspONENTE"

June 04, 2008

www.eksponente.lt

1

Energy future trends



The Future – for Responsible energy

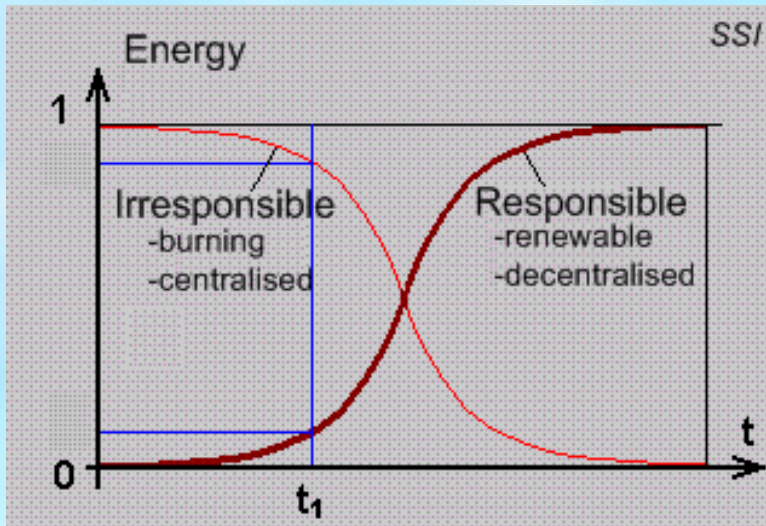
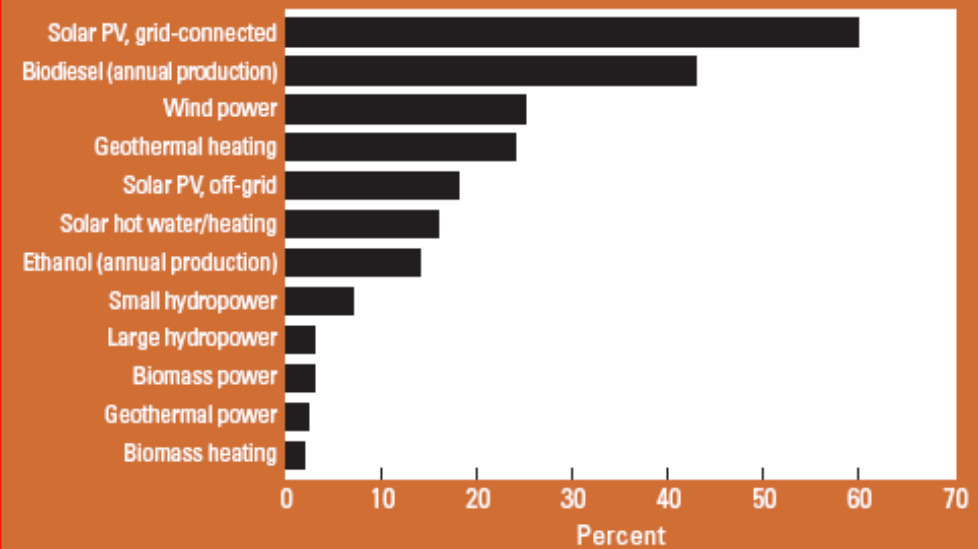


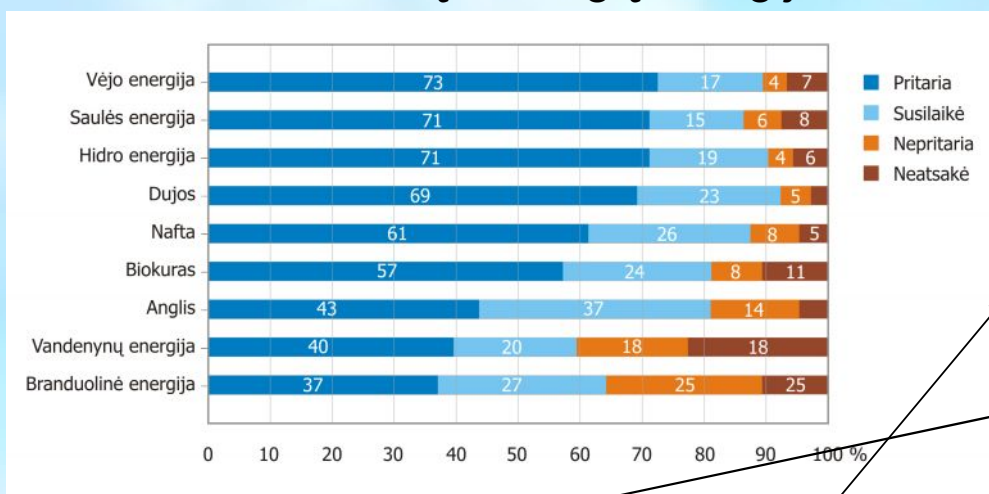
Figure 3. Average Annual Growth Rates of Renewable Energy Capacity, 2002–2006



Lithuanian and EU people – for energy of sky

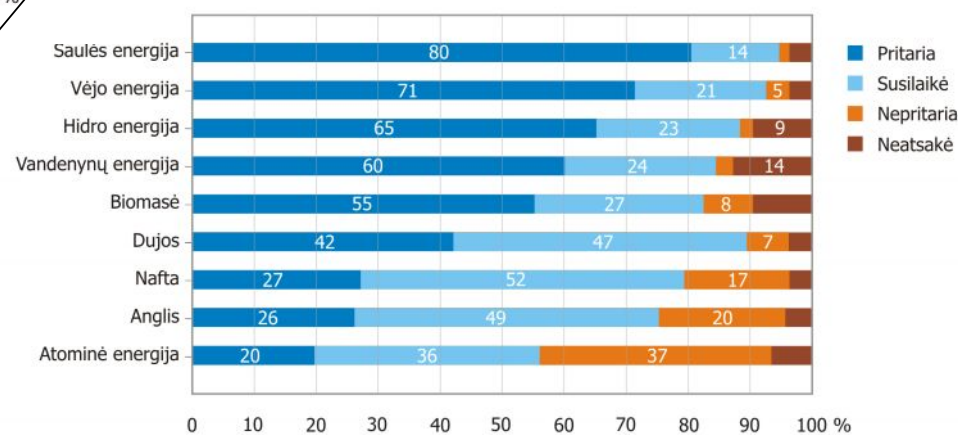
Eurobarometras, 2006

Pritariate ar ne šių skirtingų energijos išteklių panaudojimui Lietuvoje?



Vox populi – vox Dei!

Democracy – power of people

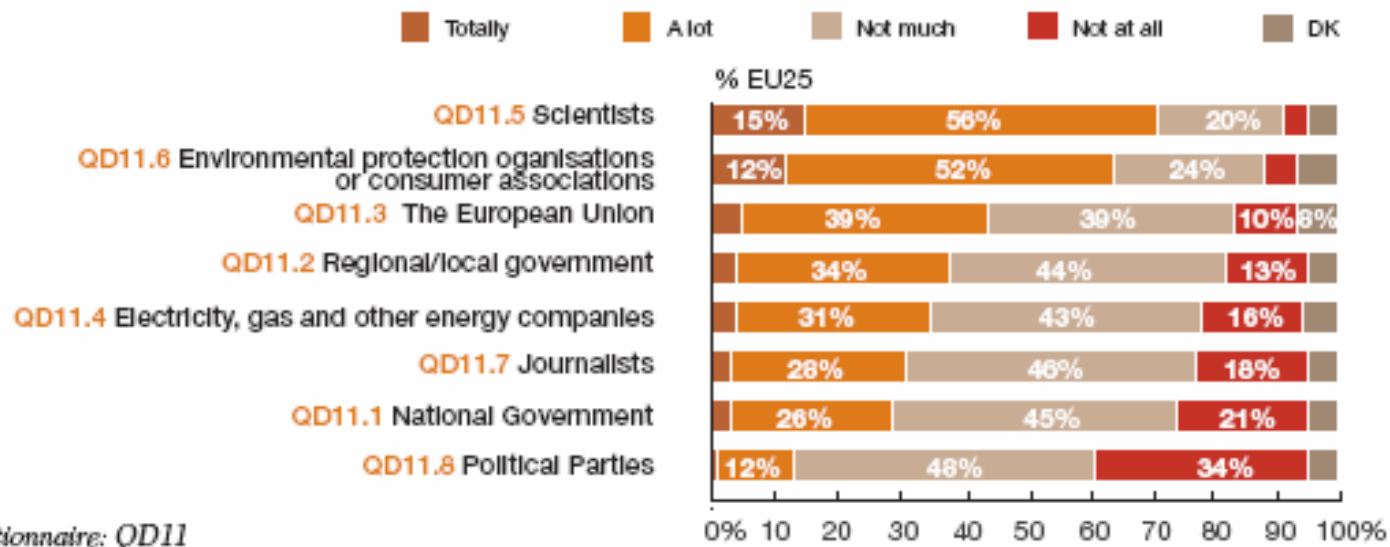




Energy trust, EU25

Eurobarometer, 2006

QD11 To what extent would you trust information about energy related issues from each of the following sources?



Ignalina NPP should be closed at end of 2009

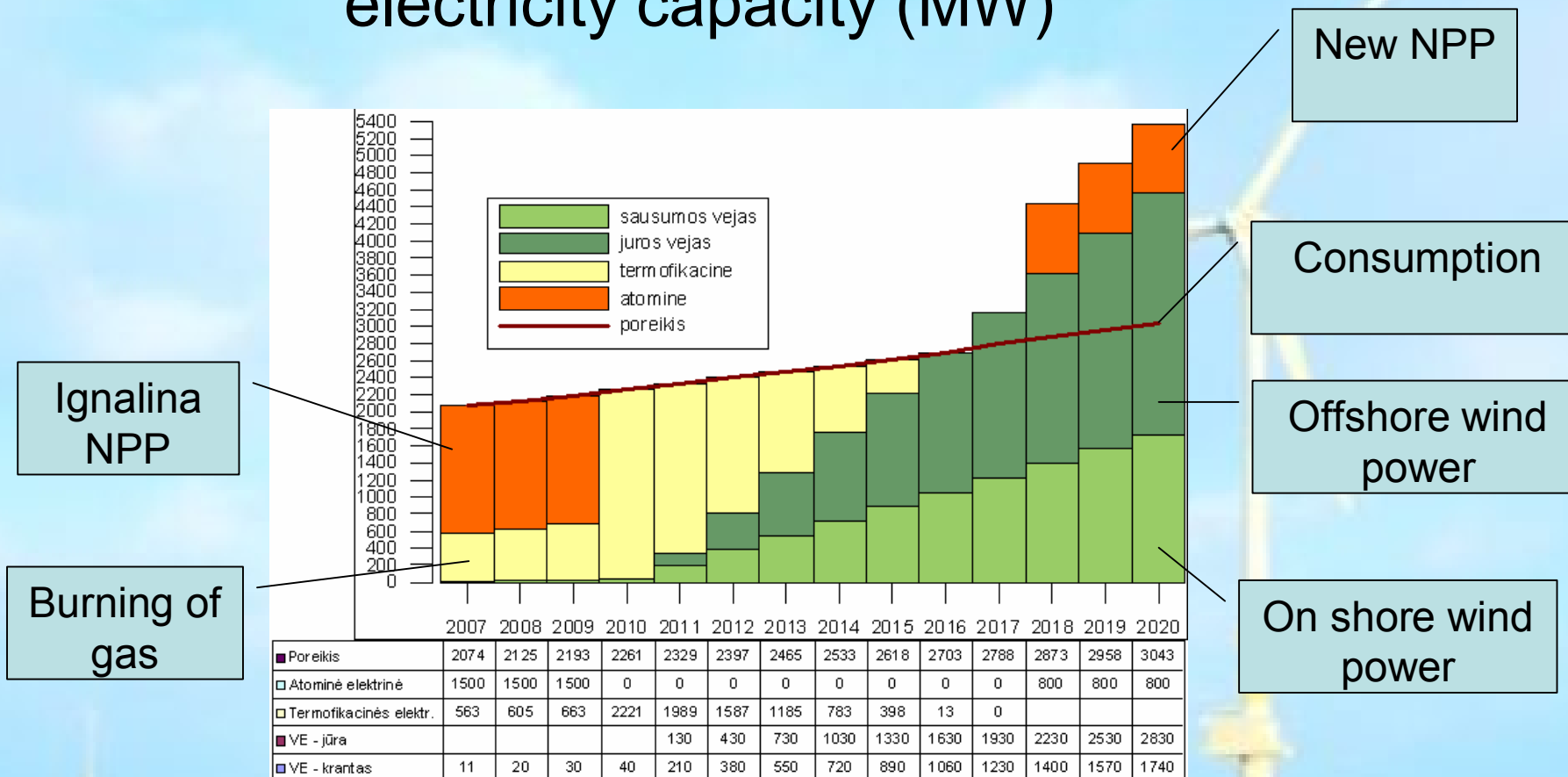


June 04, 2008

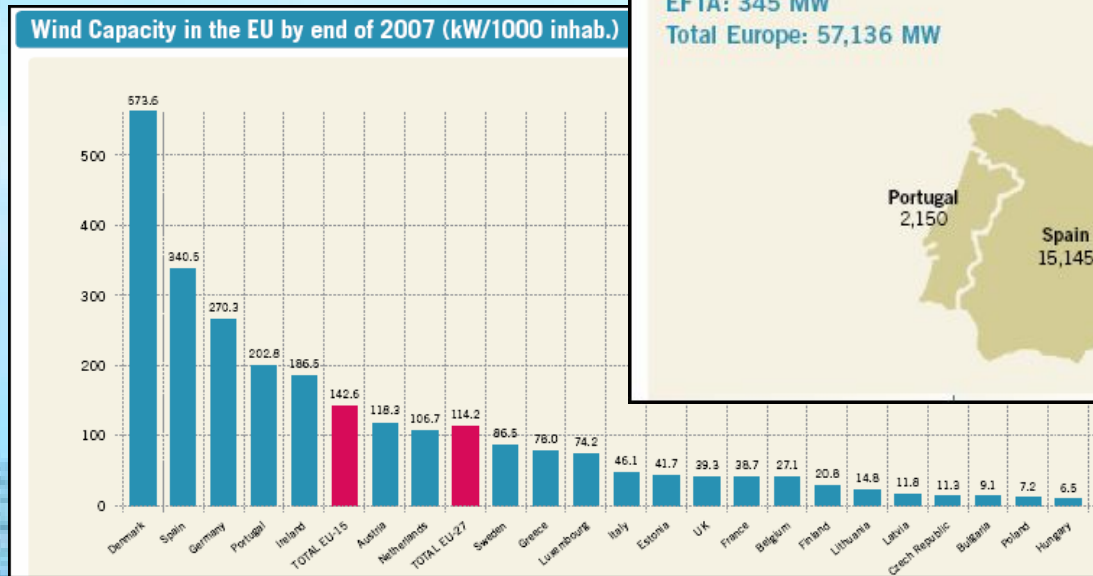
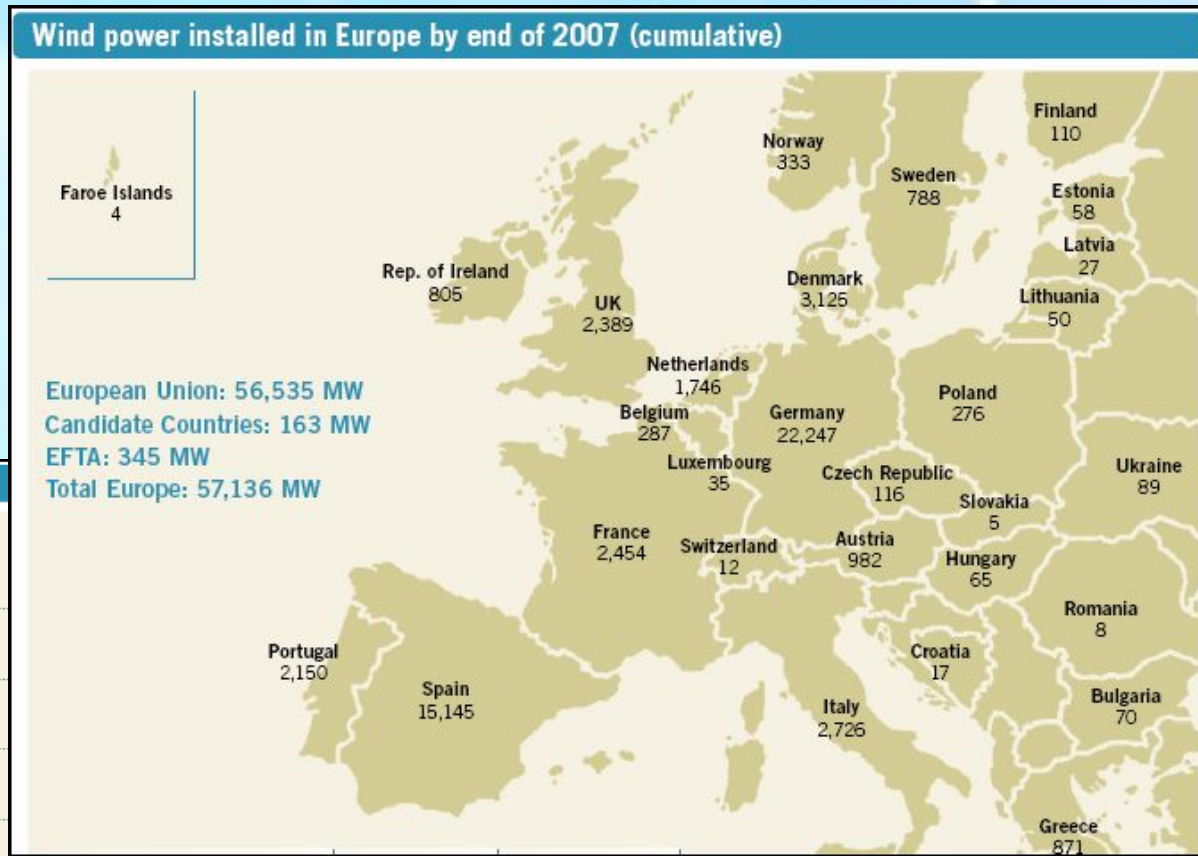
www.eksponente.lt

6

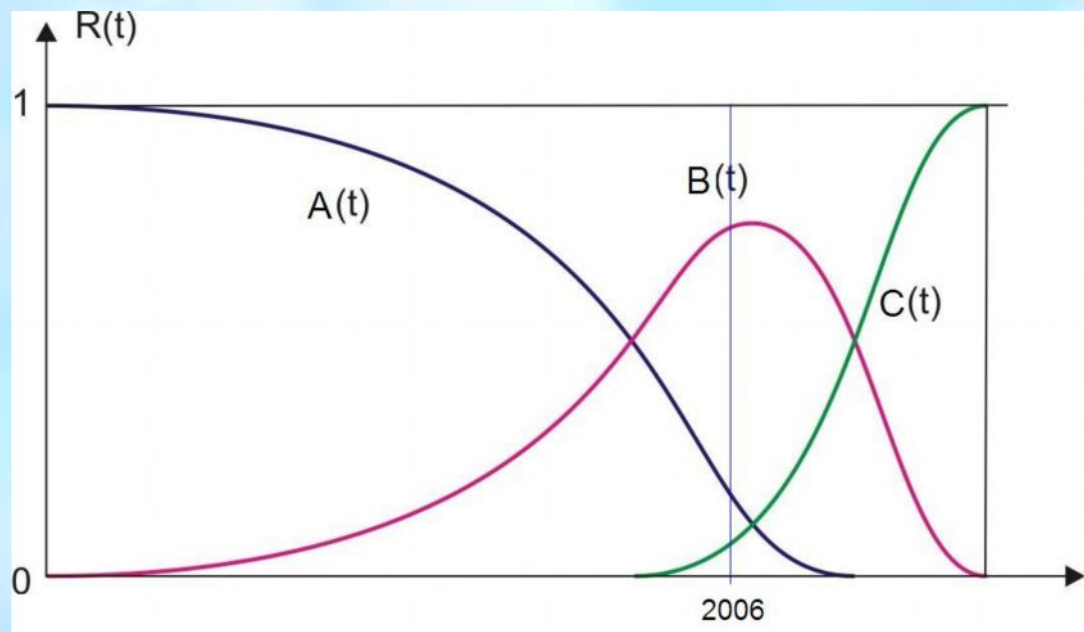
The forecast of dynamics of needs for electricity capacity (MW)



Lithuanian wind power in Europe



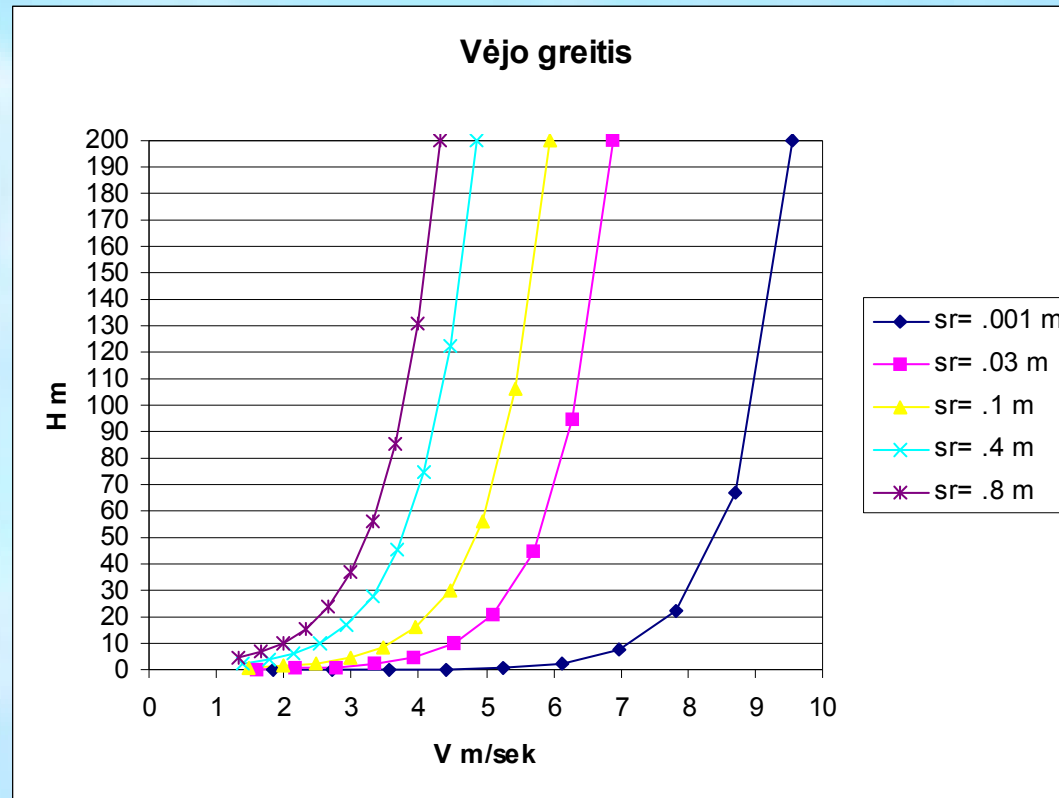
Transition of attitude to wind power



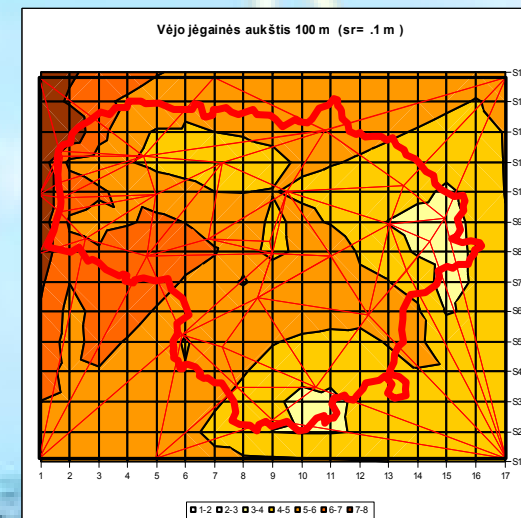
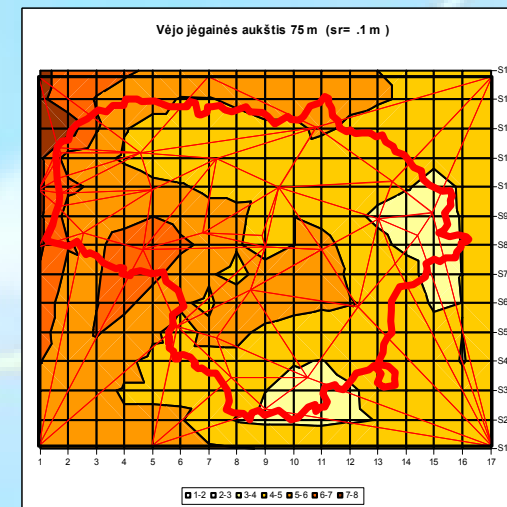
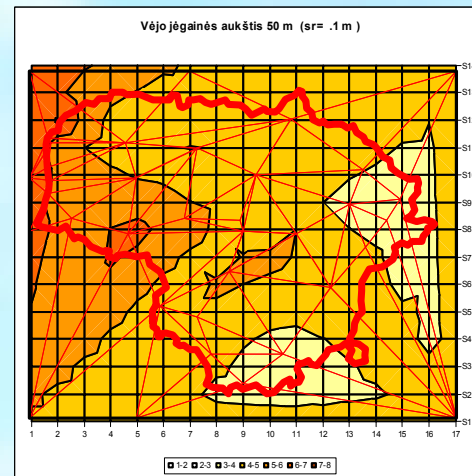
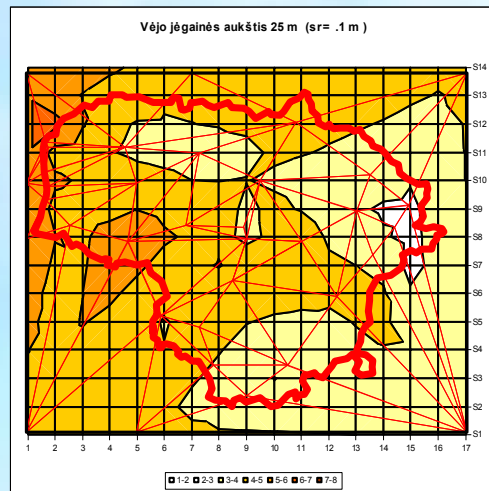
$$R(t) = A(t) + B(t) + C(t)$$

$A(t)$ 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



June 04, 2008

www.eksponente.lt

11

To create a wind economy branch

Kriterijai	Scenarijus	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 funds 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

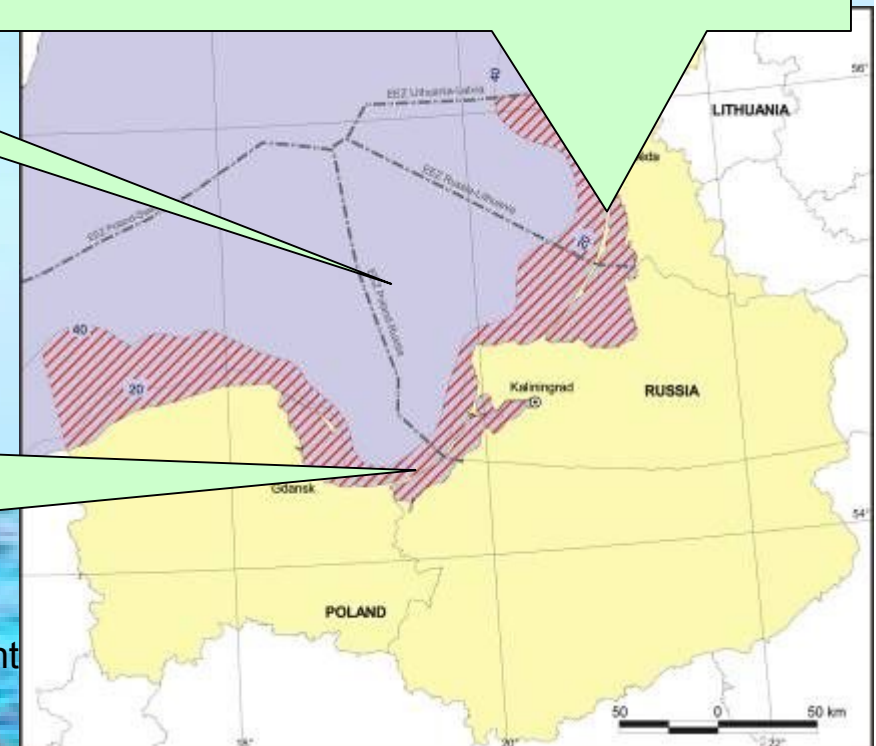
- Atlantic Branch, Institute of Oceanology, Russian Academy of Sciences

LITHUANIA, Klaipeda county

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

Poland, Pomorskie voivodeship

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

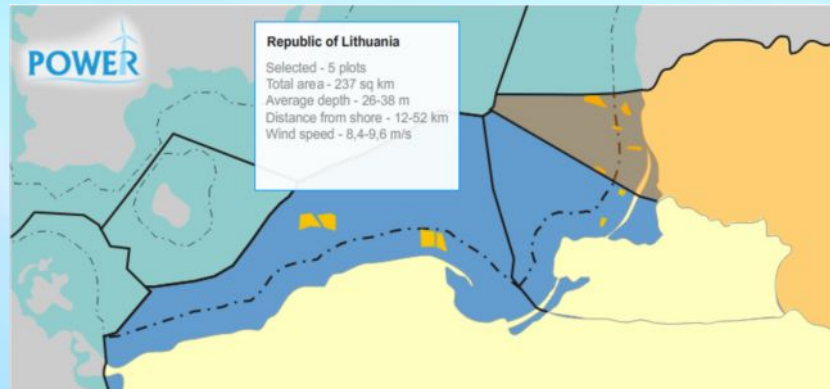
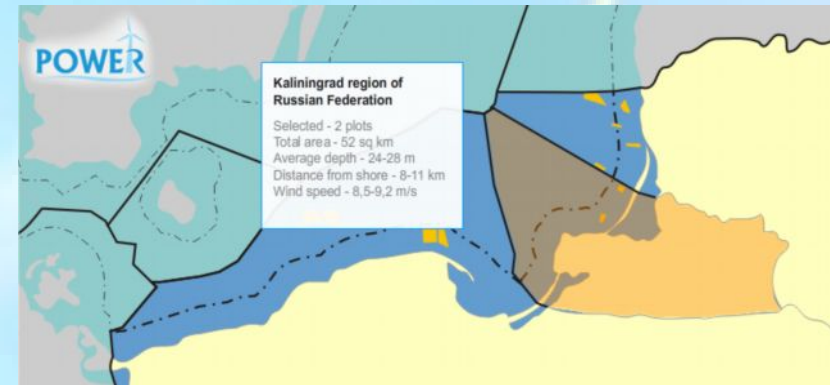
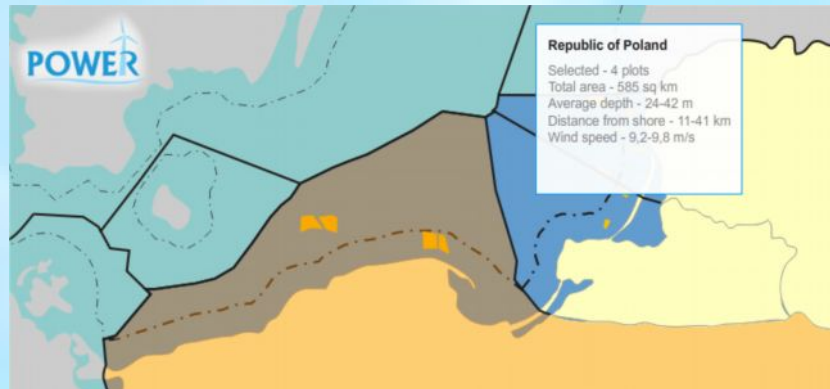


June 04, 2008

www.eksponent

11 plots in 3 countries

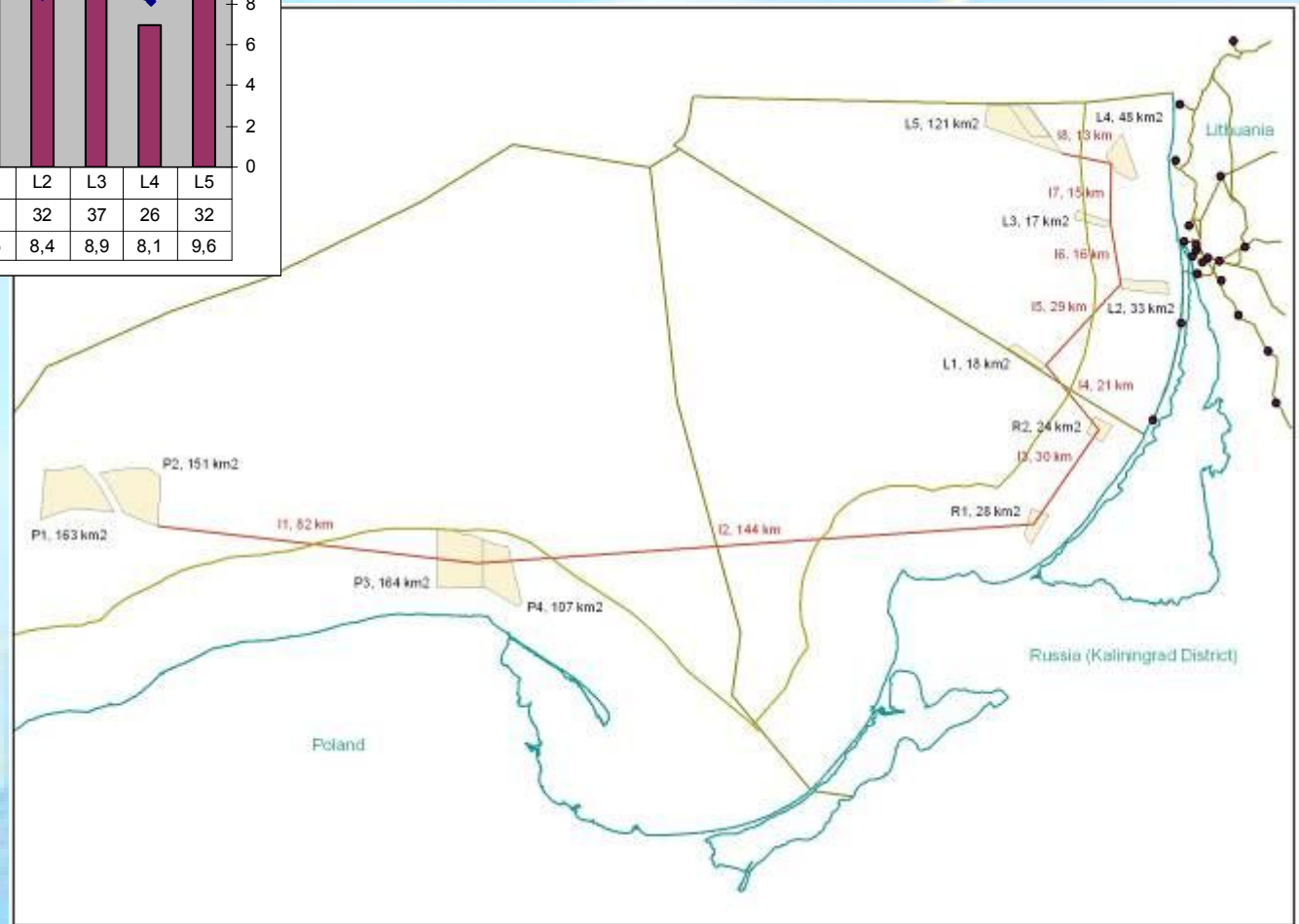
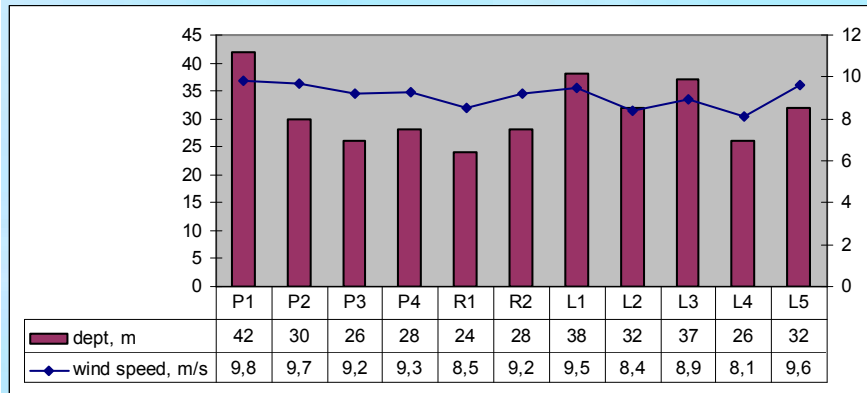
<http://www.bosec.lt/eco>



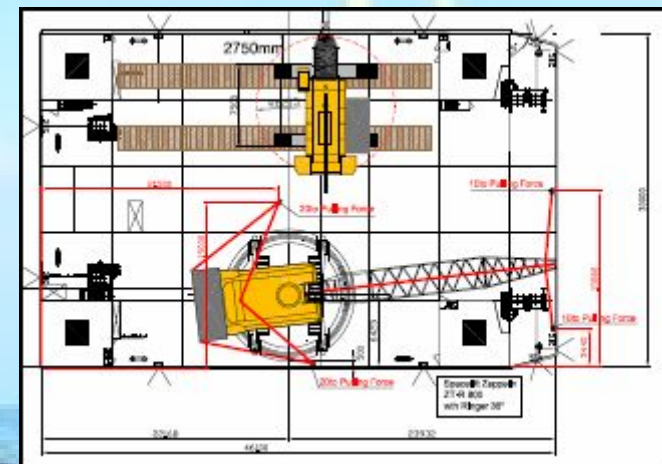
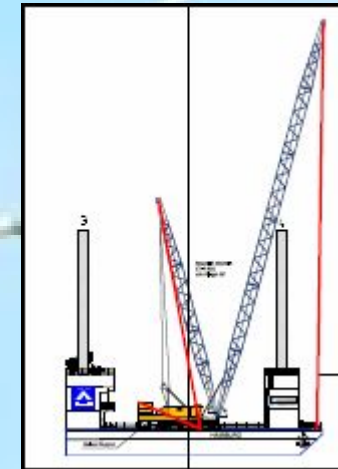
Country/	WP name	FID	Area, km ²	Nordex, 2.5 MW				Vestas, 3 MW			GE, 3.6 MW			RePower, 5 MW		
				turbines	MW	M€	turbines	MW	M€	turbines	MW	M€	turbines	MW	M€	
Poland			585	1306	3265	6530	1031	3093	6186	772	2779	5558	527	2635	5270	
	P1	3	163	364	910	1820	287	861	1722	215	774	1548	147	735	1470	
	P2	2	151	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



Made in Lithuania



June 04, 2008

www.eksponente.lt

17

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%

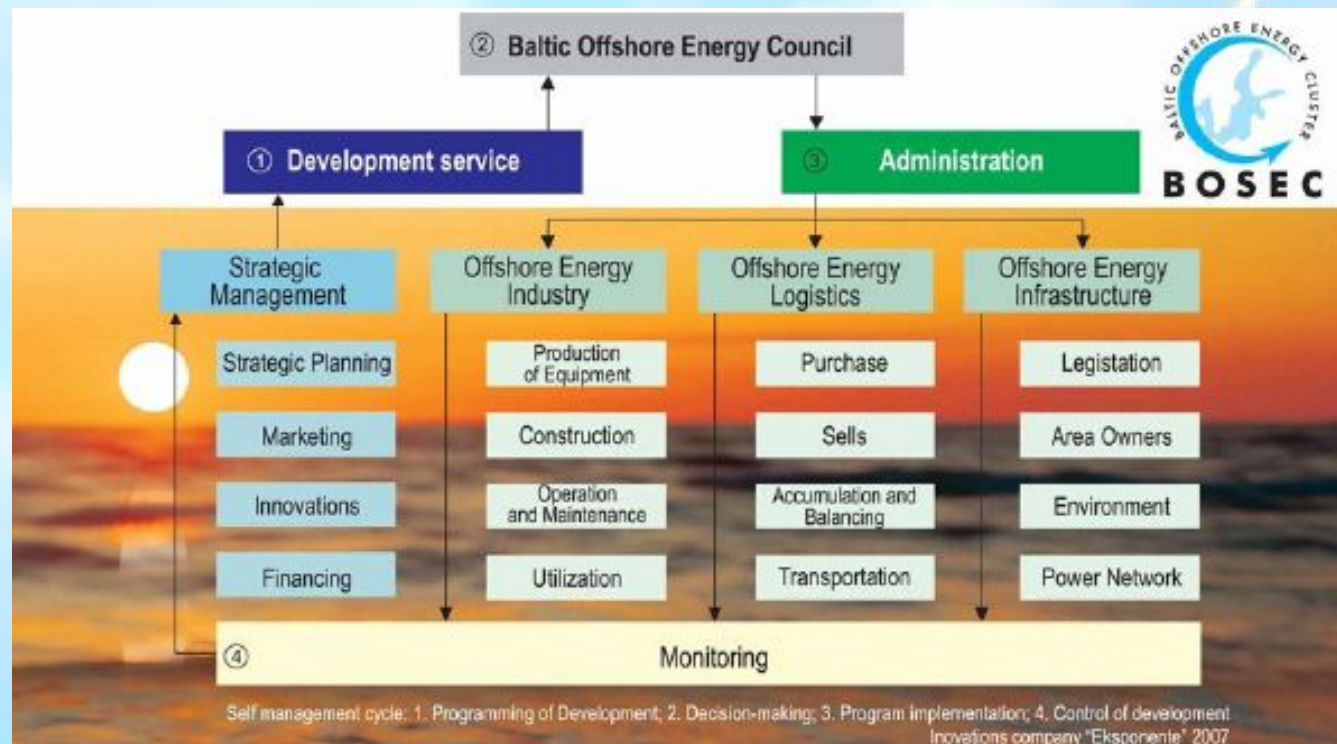
To avoid disintegration

- **The biggest problem – disintegrated facilities 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



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



Members of the Initiative Group



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

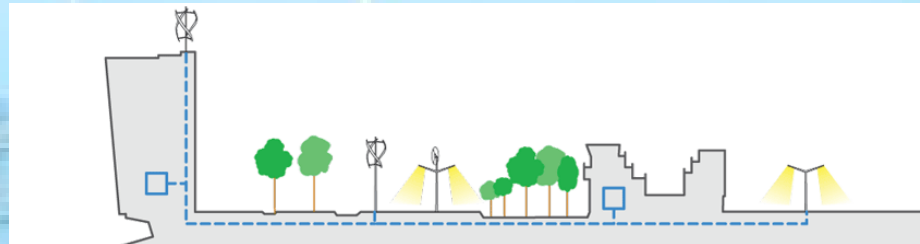


What shows a telescope of future at 2020?

- 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



June 04, 2008



www.eksponente.it



24

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!



June 04, 2008

www.eksponente.it

26