5th European Innovation Summit

Unchain Europe's Innovation Heart - 5 Calls to Wake Up Europe!

30 September - 3 October 2013
European Parliament,
Brussels

knowledge 4 innovation

Transformation Towards Sustainable Society

Determining Factor Is New Value System

The Centre on Economy of Renewable Energy and Distribution System
in cooperation with
HONORS j.s.c. & NOVITECH j.s.c. Košice, Slovakia

Dušan LUKÁŠIK

The Centre On Economy Of Renewable Energy And Distribution System

Founders:

Slovak University of Technology in Bratislava
The Technical University of Košice,
University of Economics in Bratislava,
HONORS, a.s., Liptovský Mikuláš,

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The Centre On Economy Of Renewable Energy And Distribution System

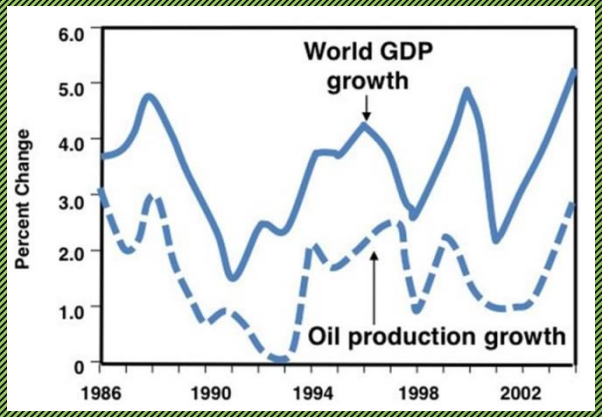
- Graduate in electrotechnics (1978). Doctorate in physics and mathematics (1980)
- Research and development in Tesla Liptovský Hrádok, Slovakia, Telecomm industry (1981 – 1991)
- Capital markets (1992 – 1995)
- Chairman of the board in HONORS, j.s.c. (1997-2003)
- Research of transformation of social and pension system in Slovakia – advisor to ministry for labor, family and social affairs (1999 -2002)
- Member of the board in Novitech j.s.c. ,Košice (2002 – 2004)
- Advisory to Chairman of the Economy Committee of Slovak parliament (2007 – 2012)
- Member of the convocation of Civil Engineering Faculty Technical University Of Košice, Slovakia (2008-)
- Member of the board of The Centre For Research on Economy of Renewable Energy and Distribution Systems, Košice (2008 -)

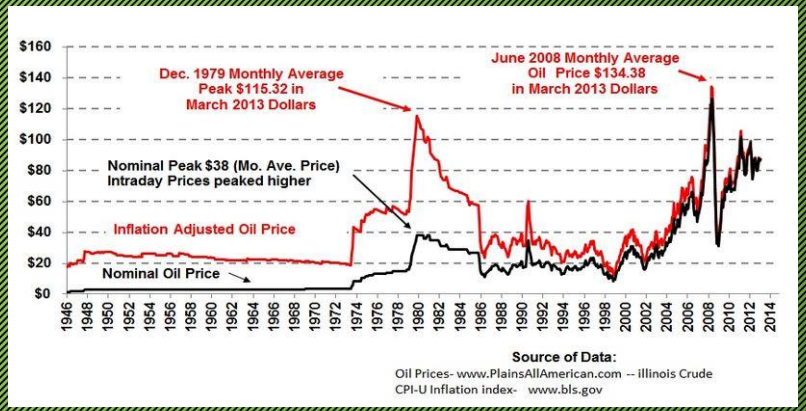
The Centre On Economy Of Renewable Energy And Distribution System

Structure :

1. Natural resources and GDP , energy sector and pension system
2. Non recovery transformation process starting 1995
3. Case study No1 : Transformation of the office building towards NET zero energy building
4. Case study No 2 : Transformation of the energy market
5. Case study No 3 : Transformation of the pension system
6. Case study No 4 : Corruption perception index in role of risk premium
7. Concluding remarks

Natural Resources and Human Economy Activity

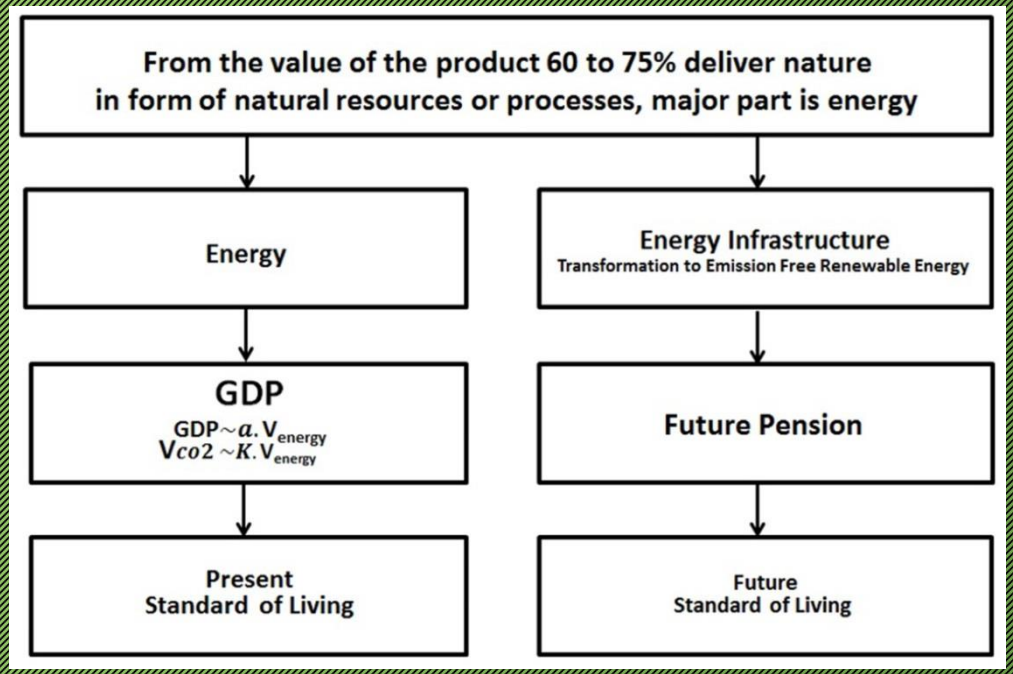




- Rising price of crude oil of 10% during 12 months will decrease world GDP of about 0,4%
  Source : O´Neil, chief econom of Goldman Sachs 2009
- Double the price of crude oil will within next three months develope economy crisis
  Source : James Hamilton 2009
- Solution of energy crisis of 70ties was IT technology. In course of 15 years IT technology squeezed down in average of about 50% the value of energy needs per Unit GDP

Energy Infrastructure and Pension System

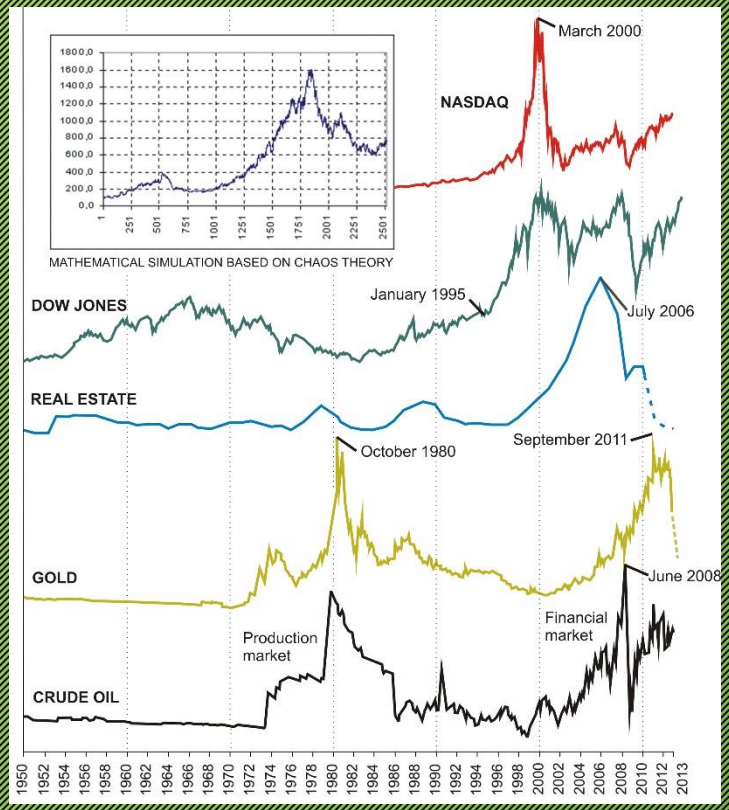
Too low price of energy – wastage of energy

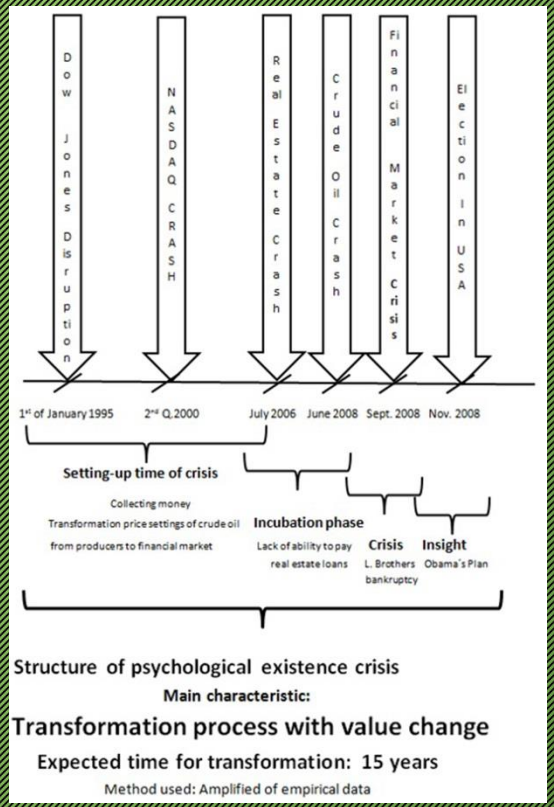


Too high price of energy – economic crisis

Solution – harmonisation of these two contradictions

Crises of Transformation with Value Change?





The shape of the peaks on different markets is not possible to explain within the mainstream economy based on the model of free independent rational decision

The shape of the peak could be modeled under assumption that investors are highly influenced in their decision by each other

Chaos theory could explain the behavior of investors in form of Polarized Crowd P. Ormerod

Non recovery transformation process is going on under cyclic crisis on different markets which fulfill criteria of existence crisis model developed by psychology V.Kast

Roots of Transformation Process

- The transformation process if progressively solved creates new value system
- In case of regress extra cost will be imposed
- Two main problems has been identified:
  1. Climate change – means new value connected to social cost of carbon emission. Eco systems are not able to recovery waste produced by human economic processes
  2. Technology crises - crisis of technologies converting clean energy into the form suitable for human economy process

Case Study 1:
Transformation of the Common Office Building into NET Zero Energy Building

1996

Present 2013

Future 2020

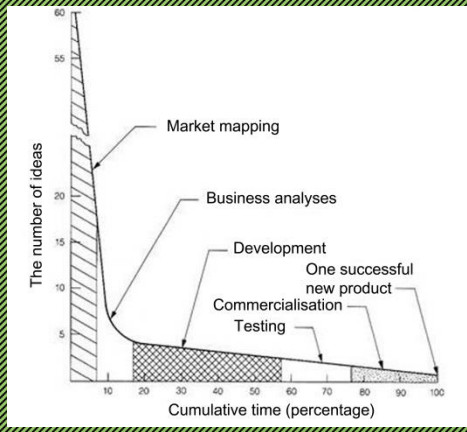
EU innovation policy 2006 : Intelligent buildings with nearly zero energy consumption

40% of all energy in EU consumes buildings

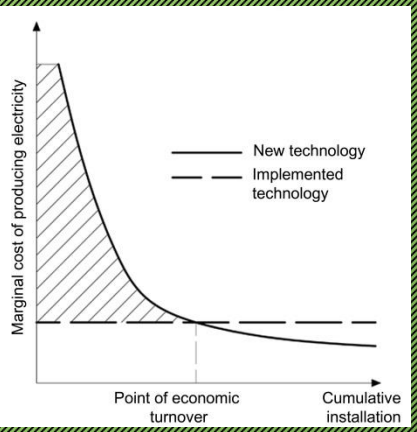
Technology selection – knowledge curve

Two different types of knowledge courve:

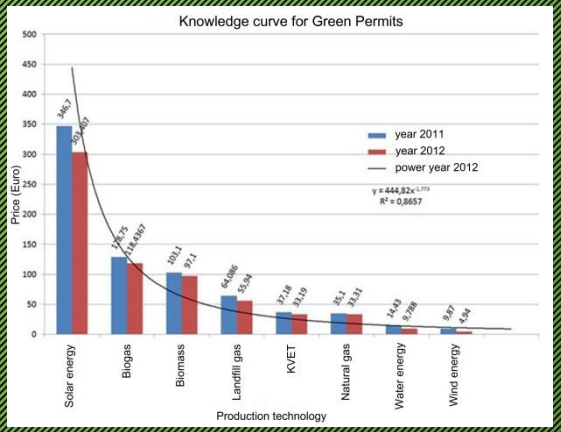
Qualitative



Quantitative



Example Knowlege line for Green Credits

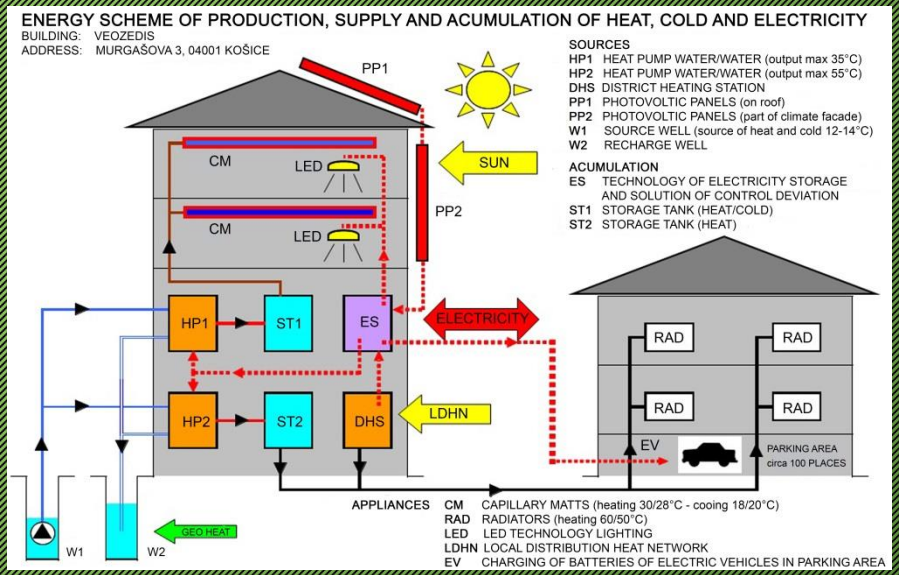


Energy Scheme and Technology Selected

Technology selected :

1. Energy efficiency:

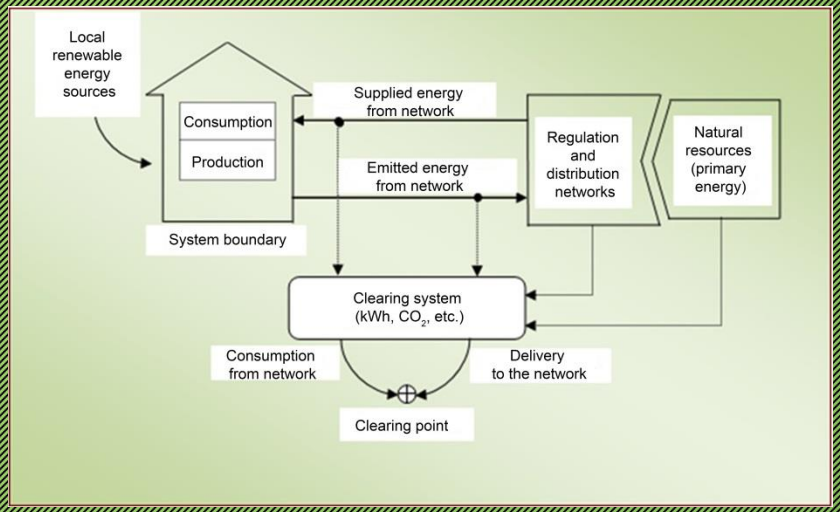
- 1997 - Reconstruction of fossil energy source (ROI 2)
- 1998 - 2004 windows replacement and thermal insulation (ROI 6)
- 2005 – Thermostatic regulation (ROI 6)
- 2010 – Sensor detectors in corridors (not measured)
- 2011 – Microcapillar Ceiling System (ROI 16)
- 2014 – LED lightning

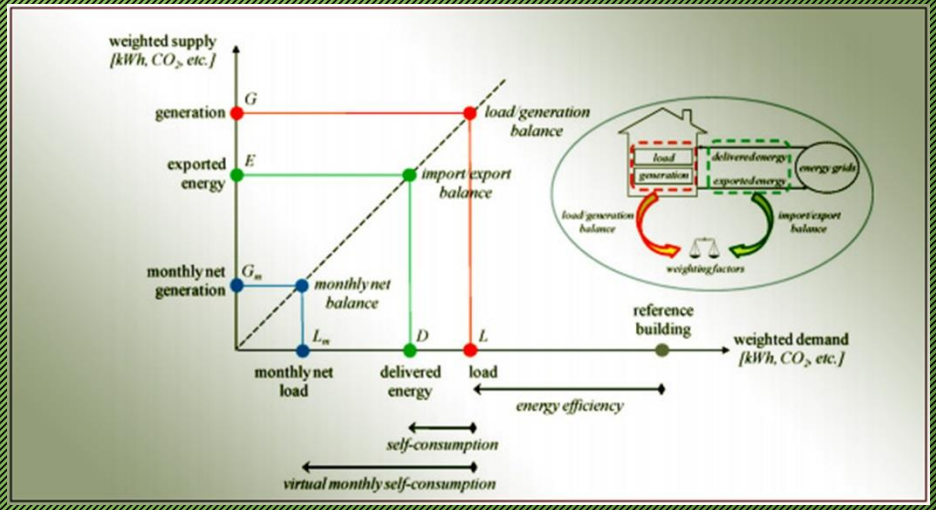


Local Renewable Energy Source:

- 2008 Heat source – heat pump water-water (ROI 8)
- 2011 Renewable water cooling system in combination Micro capillary Ceiling System (ROI 16)
- Plan -2018 to 2020 – solar power plant

Principles of Net Zero Energy Balance





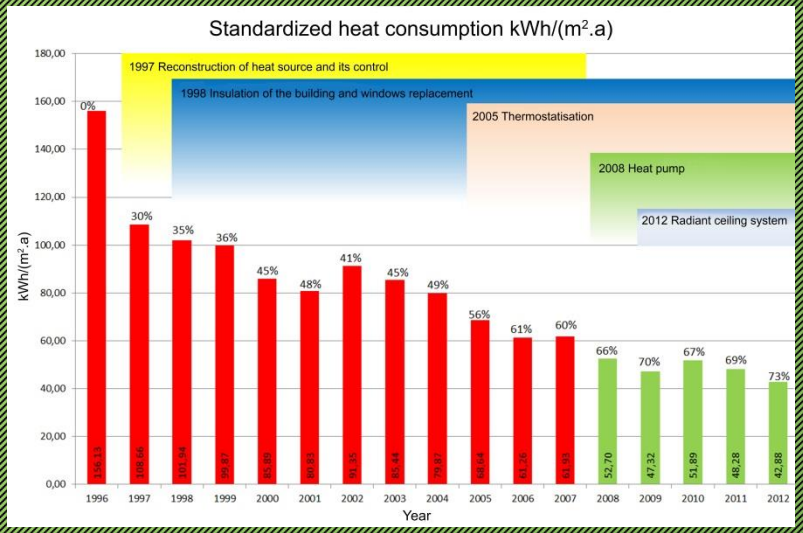
NetZEB balance = | weighted supply| - | weighted consumption|

From few large power plants to huge number of small local renewable energy sources

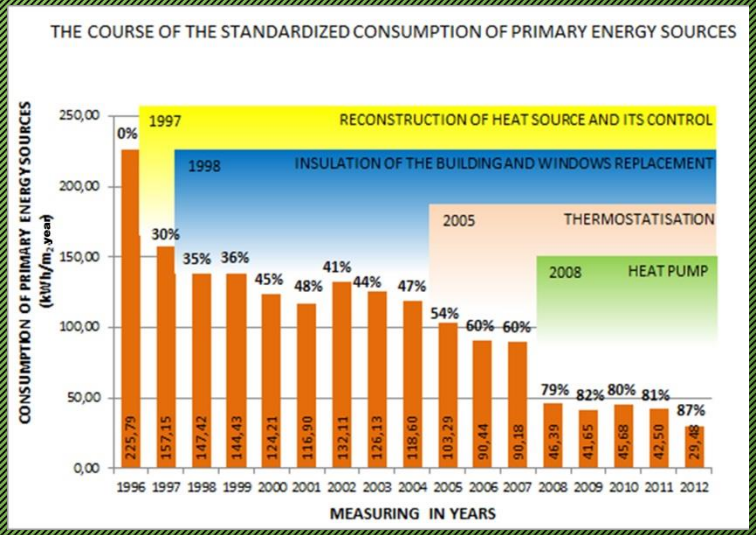
„Small is beatifull“ ***E. F. Schumacher***

Heat Savings and Primary Energy Savings

73% heat reduction



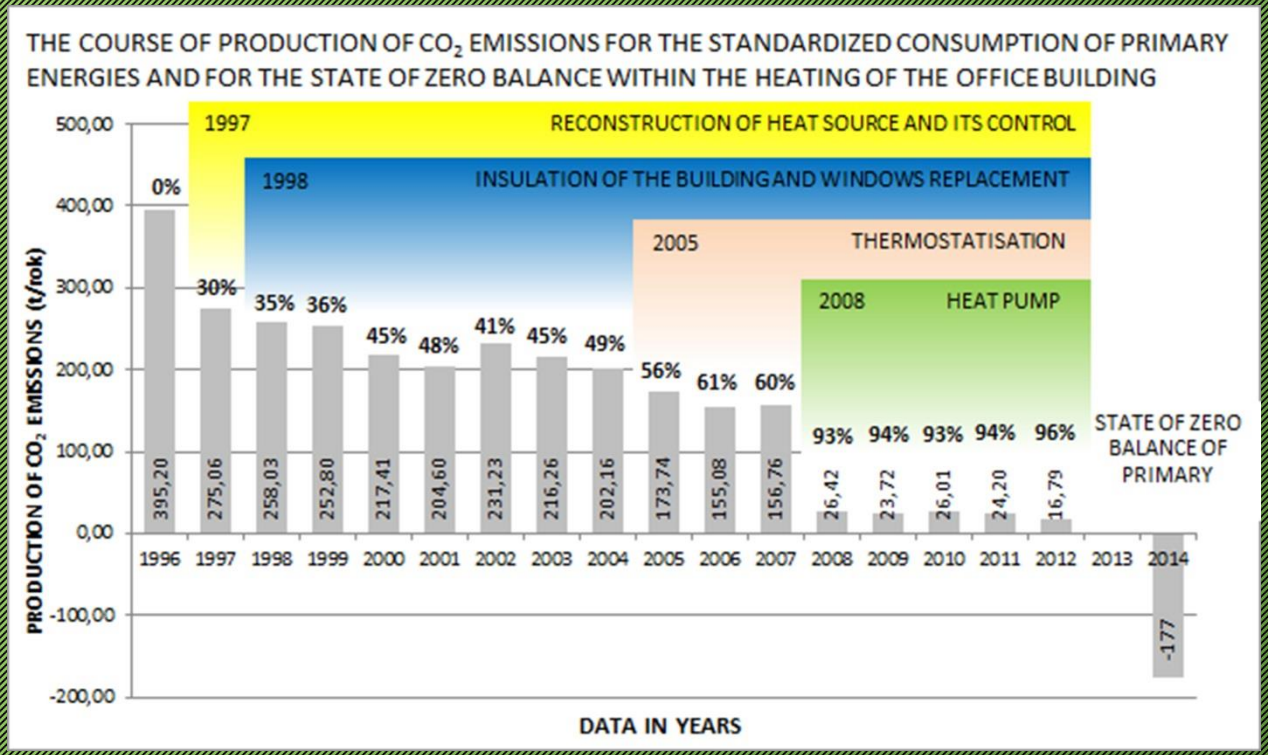
87% primary energy reduction



Energy which cross the system boundary from inside the building

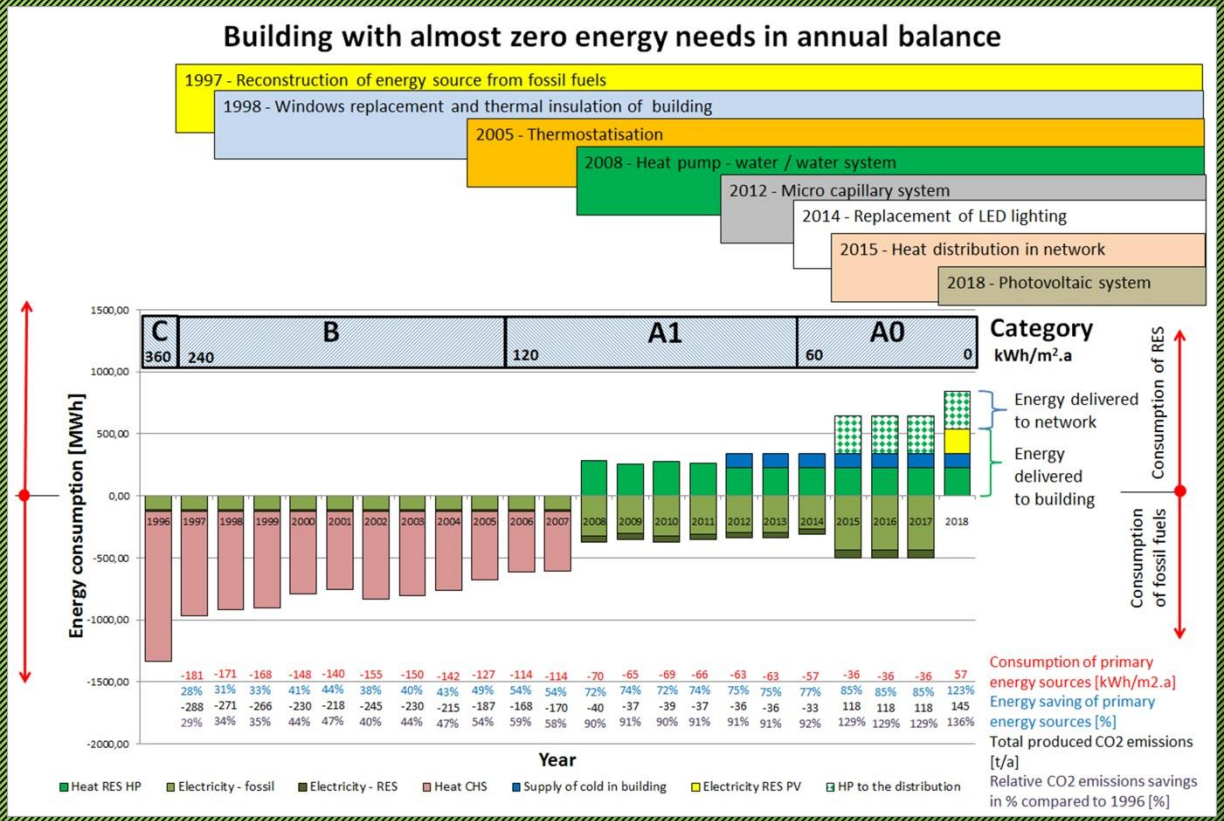
Energy which cross the system Boundary from outside the building

Carbon Emission Savings



Transformation of the building to net zero energy building – step by step 20 years process

From 360 kWh/ m².pa in the year 1996 to 64kWh/m².pa in the year 2012 ***No subsidies used at all***

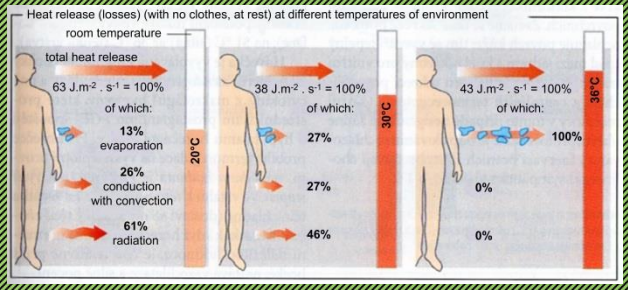


Problems

1. No income from generated green credits
2. Economy barrier in order to supply to public district heat system
3. Redistribution economy processes on energy market between investors

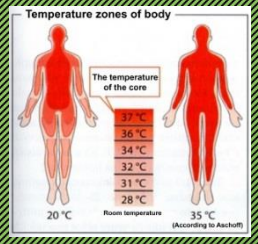
Micro capillary ceiling system + renewable hydrothermal energy source = answer to climate change in buildings

Physiology of human

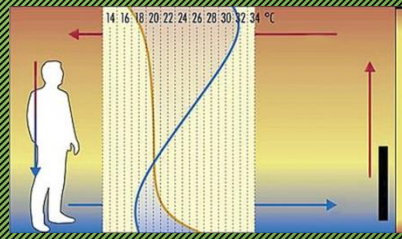


Vertical distribution of the temperature

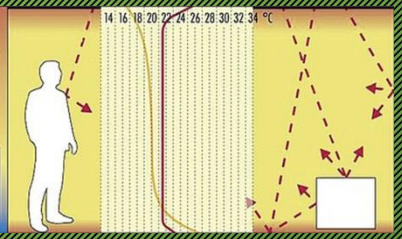
Human body



Radiators – convenction transport



Ceiling system- Radiation transport



Radiation transport – Ceiling micro capillary systems

First step – energy expose surfaces of constructions – no air is moving

Second step – the constructions heats/cools air. Small temperature gradient means that system fulfills condition of thermal comfort V_{air}

Human skin has correct information and temperature of the body is balanced continuously to climate

Convection and conduction transport principle

First step – heats/cools air - the process is based on moving air. During cooling via air condition V_{air}. Due to principle also relative humidity is falling under required level.

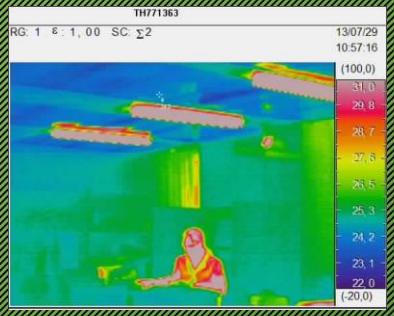
Second step – air heats/cools surfaces of constructions. Due to V_{air} human skin receives false information hence thermo receptors wrongly inform center for body regulation. The human body is not thermo balanced.

Micro capillary ceiling system + renewable hydrothermal energy source = answer to climate change in buildings

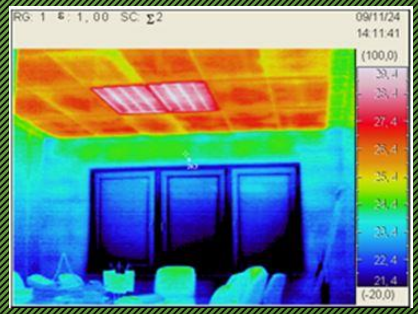
Heat pump renewable energy source + micro capillary ceiling system:

1. Shifts SPF from 3 to 4 during heating. Expected SPF
2. Enhance sortiment provided services in form of cooling during summer with SPF = 13. Expected SPF
3. Full year 2012 SPF = 5,71 . Expected full year SPF.
4. Heat waves occur in EU as a consequence of climate change. In extreme it causes 33% rise of probability of collapse of human if the heat wave will expose human body 48 hours and more. During summer 2003 25 000 EU citizen died and during summer 2010 45 000 EU citizen died as a consequence of heat waves.
5. Heat wave could be interrupted if a person will balanced his thermal energy staying in climate produced ceiling system.

Microcapillary ceiling system



Cooling

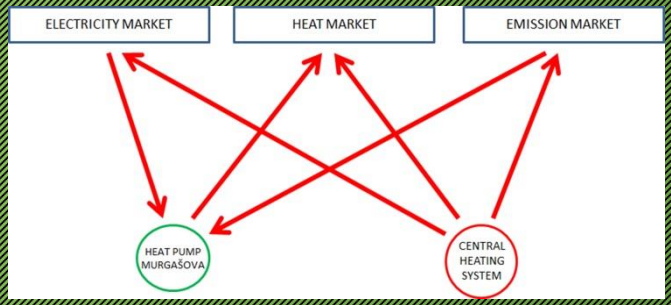


Heating

Case study No2: Transformation of the Energy Market Towards Renewables

Present organization of the energy market:

1. Pure concurrency principle
2. Positive discrimination of renewable energy based on:
   - Preferred access to distribution network
   - Negatively stimulated market in favor of investors in form of feed in tariffs
3. Redistribution economy processes as a consequence of:
   - Feed in tariff principle – technology is financed not values are paid
   - Organization of the market with carbon emissions

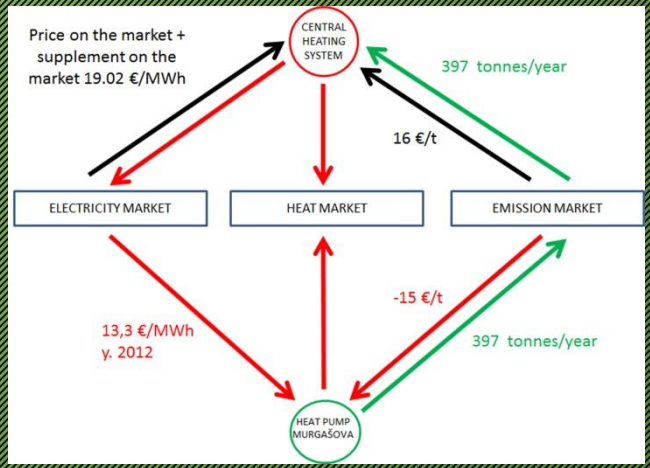


Example – redistribution processes between district heat energy source and local renewable energy source:

Price on the heat market where competition is was in the year 2012: 75,6 €/MWh

Economy redistribution processes:

1. Electricity market : 22,32 €/MWh in favor of DCHS
2. Carbon emissions : 32,9 €/MWh
3. Heat market : local source is not allowed to apply fixed cost : 31,78 €/MWh

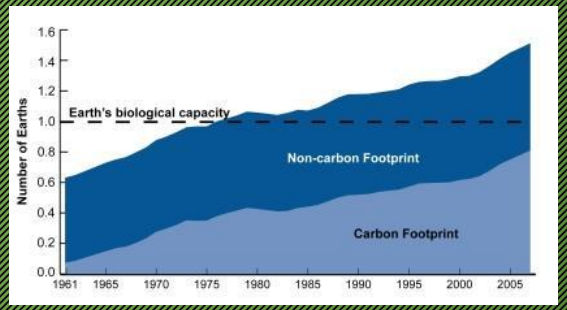


Economy barrier total: 22,32 + 32,9 + 31,78 = 87 €/MWh more than market price

Two values on energy market

There are two basic values on energy market:

1. Energy itself in following basic form suitable for human economy processes:
   - Electricity
   - Heat
   - Cold
2. Social cost of carbon in following forms:
   - Expenditures which should be used in order to cover the damage caused emitted greenhouse gases – 20 €/t to 70€/t Stern report 2006
   - Expenditures which should be used in order to supply energy without parallel production of greenhouse emission

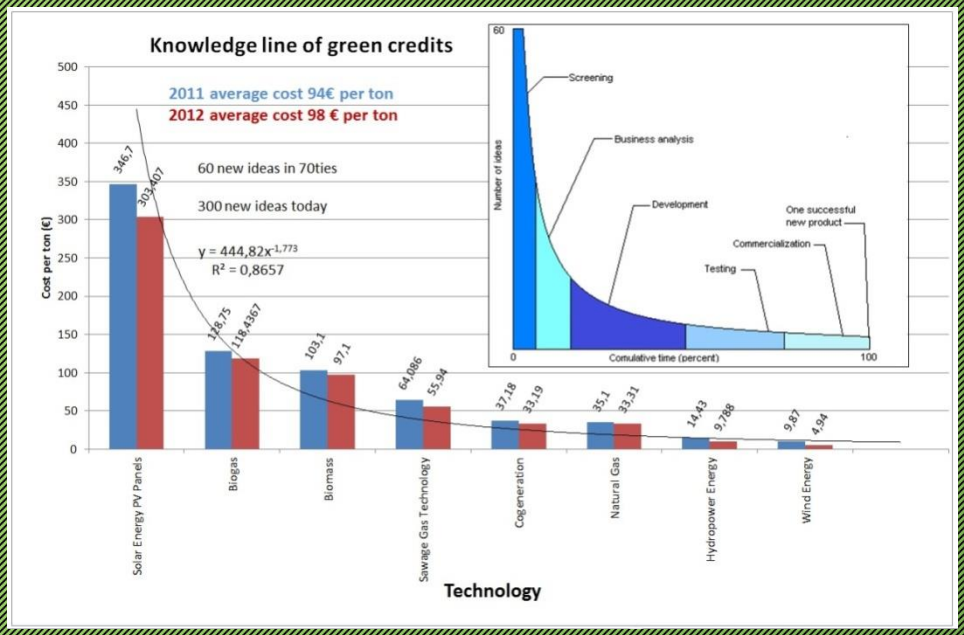


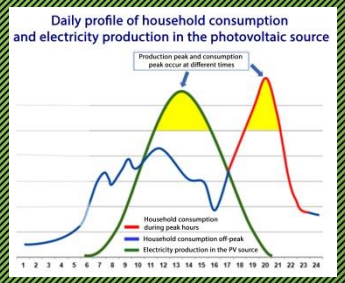
Feed in tariff subsidies

Feed in tariff subsidies are used as main vehicle in order to support renewable energy and cogeneration systems. Their negative impact on energy market is as follows:

1. They damage relative prices – basic of the market function
2. They redistribute economic resources through energy market between investors in favour of preferred investors on cost of the others
3. They act as consumption tax and change distribution of values within society. The system prefer investors and make en economy burden on consumers. Because of the nature this is one of the most social harming construction
4. Without proper plan of capacities market itself has no capacity regulation mechanism. This construction damage third basic function of the market need to set up rules
5. In combination with proffered access on the market feed in tariff destroys competition. Market is negatively stimulated in favor of investor on cost of consumer
6. Economy fall down with their competitiveness

Social cost of carbon emission





In average 8 hours difference between production and consumption means necessity to store energy with the related loss

Photovoltaic solar power station:
Maximum feed in tariff: 430 €/MWh
Cost of emission:

1. Distribution loss to storage 15%
2. Storage loss 28%
3. Distribution loss to consumer : 15%
4. Total cost for consuming 1 MWh = 430x1,48 = 636,4 €
5. Market price of ellectricity : 40 €/MWh
6. Emission Factor K = 0
7. Cost of carbon : 636,4 – 40= 596,4 €/t = Green Credit

Everage cost of green credits in SR:
2011 = 94€/tonn
2012 = 98 €/tonn

Social cost of carbon according Stern report: 20€/t to 70€/t

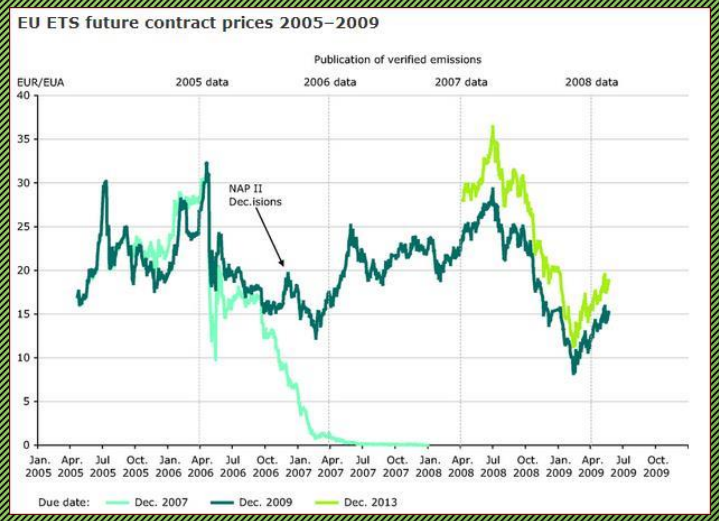
Technologies with the cost of higher than social cost of carbon should be put in the R&D and financed from the corporate or public money

European Climate Exchange

Justification
The ETS market is an artificial market on which what is in fact being sold is 'hot air'. The scheme penalises EU industry and is a godsend for the financial markets, allowing them to engage in all manner of speculative activities, bordering at times on fraud. After Doha, only the EU is still clinging to the illusion that 'the markets' can be used to tackle climate change.

Francisco Sosa Wagner Member of European Parliament

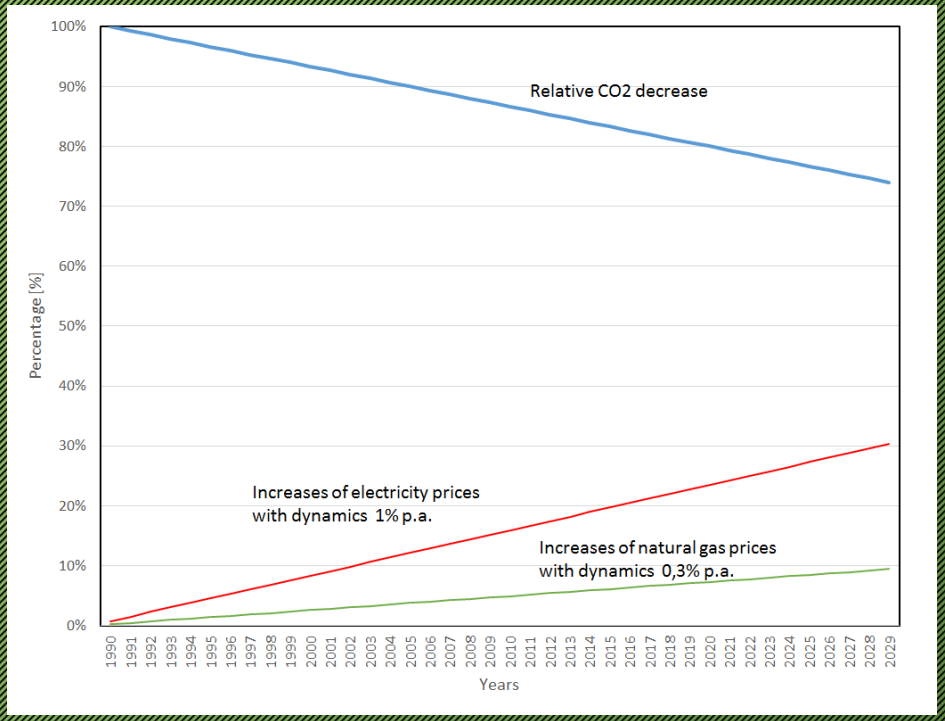
European Climate Exchange



Electricity market

Transformation of the CO_2 emission

Year	Number of CO_2 tonn p.a	Tax €/t	Tax total €	Saldo between tax and Green Credits	No of Green Credits tonn	Price of Green Credit €/t	Volume of Green Credits €	Electricity Base price = 40€/MWh Emission factor K = 0,65t/MWh		Natural Gas Base price = 40 €/MWh Emission factor K = 0,202t/MWh	
								Increase of price €/MWh	Increase of price %	Increase of price €/MWh	Increase of price %
1990	5574400000	0,47	2601386620	0	37162666	70,00	2601386620	0,30	0,76%	0,09	0,24%
1991	5537237334	0,93	5168088086	0	74325332	69,53	5168088086	0,61	1,52%	0,19	0,47%
1992	5500074668	1,40	7700104397	0	111487998	69,07	7700104397	0,91	2,27%	0,28	0,71%
1993	5462912002	1,87	10197435554	0	148650664	68,60	10197435554	1,21	3,03%	0,38	0,94%
1994	5425749336	2,33	12660081557	0	185813330	68,13	12660081557	1,52	3,79%	0,47	1,18%
1995	5388586670	2,80	15088042405	0	222975996	67,67	15088042405	1,82	4,55%	0,57	1,41%
1996	5351424004	3,27	17481318099	0	260138662	67,20	17481318099	2,12	5,31%	0,66	1,65%
1997	5314261338	3,73	19839908639	0	297301328	66,73	19839908639	2,43	6,07%	0,75	1,89%
1998	5277098672	4,20	22163814025	0	334463994	66,27	22163814025	2,73	6,82%	0,85	2,12%
1999	5239936006	4,67	24453034256	0	371626660	65,80	24453034256	3,03	7,58%	0,94	2,36%
2000	5202773340	5,13	26707569333	0	408789326	65,33	26707569333	3,34	8,34%	1,04	2,59%
2001	5165610674	5,60	28927419255	0	445951992	64,87	28927419255	3,64	9,10%	1,13	2,83%
2002	5128448008	6,07	31112584024	0	483114658	64,40	31112584024	3,94	9,86%	1,23	3,06%
2003	5091285342	6,53	33263063638	0	520277324	63,93	33263063638	4,25	10,62%	1,32	3,30%
2004	5054122676	7,00	35378858097	0	557439990	63,47	35378858097	4,55	11,37%	1,41	3,53%
2005	5016960010	7,47	37459967403	0	594602656	63,00	37459967403	4,85	12,13%	1,51	3,77%
2006	4979797344	7,93	39506391554	0	631765322	62,53	39506391554	5,16	12,89%	1,60	4,01%
2007	4942634678	8,40	41518130550	0	668927988	62,07	41518130550	5,46	13,65%	1,70	4,24%
2008	4905472012	8,87	43495184393	0	706090654	61,60	43495184393	5,76	14,41%	1,79	4,48%
2009	4868309346	9,33	45437553081	0	743253320	61,13	45437553081	6,07	15,17%	1,89	4,71%
2010	4831146680	9,80	47345236615	0	780415986	60,67	47345236615	6,37	15,92%	1,98	4,95%
2011	4793984014	10,27	49218234994	0	817578652	60,20	49218234994	6,67	16,68%	2,07	5,18%
2012	4756821348	10,73	51056548219	0	854741318	59,73	51056548219	6,98	17,44%	2,17	5,42%
2013	4719658682	11,20	52860176290	0	891903984	59,27	52860176290	7,28	18,20%	2,26	5,66%
2014	4682496016	11,67	54629119207	0	929066650	58,80	54629119207	7,58	18,96%	2,36	5,89%
2015	4645333350	12,13	56363376969	0	966229316	58,33	56363376969	7,89	19,72%	2,45	6,13%
2016	4608170684	12,60	58062949577	0	1003391982	57,87	58062949577	8,19	20,47%	2,55	6,36%
2017	4571008018	13,07	59727837030	0	1040554648	57,40	59727837030	8,49	21,23%	2,64	6,60%
2018	4533845352	13,53	61358039330	0	1077717314	56,93	61358039330	8,80	21,99%	2,73	6,83%
2019	4496682686	14,00	62953556475	0	1114879980	56,47	62953556475	9,10	22,75%	2,83	7,07%
2020	4459520020	14,47	64514388465	0	1152042646	56,00	64514388465	9,40	23,51%	2,92	7,31%
2021	4422357354	14,93	66040535302	0	1189205312	55,53	66040535302	9,71	24,27%	3,02	7,54%
2022	4385194688	15,40	67531996984	0	1226367978	55,07	67531996984	10,01	25,02%	3,11	7,78%
2023	4348032022	15,87	68988773511	0	1263530644	54,60	68988773511	10,31	25,78%	3,21	8,01%
2024	4310869356	16,33	70410864885	0	1300693310	54,13	70410864885	10,62	26,54%	3,30	8,25%
2025	4273706690	16,80	71798271104	0	1337855976	53,67	71798271104	10,92	27,30%	3,39	8,48%
2026	4236544024	17,27	73150992169	0	1375018642	53,20	73150992169	11,22	28,06%	3,49	8,72%
2027	4199381358	17,73	74469028079	0	1412181308	52,73	74469028079	11,53	28,82%	3,58	8,96%
2028	4162218692	18,20	75752378835	0	1449343974	52,27	75752378835	11,83	29,57%	3,68	9,19%
2029	4125056026	18,67	77001044437	0	1486506640	51,80	77001044437	12,13	30,33%	3,77	9,43%
2030	4087893360	19,13	78215024885		1523669306	51,33	78215024885	12,44	31,09%	3,86	9,66%



Generally on market supplay and demand must be met

Cap and trade system is not able to copy with all uncertainty of economy - this is the root of volatility. Transformation do not need a market, just policy.

Transformation of Energy Market

The energy market could be set up under following formula:

Earnings for fossil energy = Market price – Tax on emission CO_2 produced

Earnings for renewable energy = Market price + Green Credit produced

Functions of social cost of carbon emission in role of transformation cost:

1. It could be used for measurement of physical parameters
2. In tax form provides penalty on fossil energy used
3. In Green Credit form provides market stimuli for renewable energy
4. It naturally transform energy market towards renewables
5. The value of social cost of carbon emission regulates dynamics of transformation
6. It selects technologies suitable for market and technologies still in R&D interval
7. The value of social cost of carbon acts as new value in economic models
8. The concurrency model of market organization could be shift to more productive cooperation concurrency model with indiscriminate access both fossil and renewable energy sources

Roots of feed in tariff
„This is the largest tunnel in Czech economy ever“
Miloš Zeman president, May 2013

European Court of Justice

PreussenElektra AG v Schhleswag AG [2001] EUECJ C-379/98

The decision regarding feed in tariff principle is based on following published arguments:

1. They are no public money hence cannot be extend the scope of Article 92 Treaty
2. The principle used are not incompatible with Article 28 EC Treaty as far as the use of renewable energy sources which they are intend to promote contributes to the reduction in emissions of greenhouse gases

Solar photovoltaic systems

Figures From Slovakia

average cost CO_2 : 94€/t 2011 98 €/t 2012 extreme cost : 636,4 €/t
2013 cost CO_2 :390 mil. € next 10 years the energy market will pay 4 billion €
selling price of CO_2 : 5 €/t in 2008 or less - where is common sense?
total next 12 years expeditures : 5 billion € among about 3 billion are ineffective

Figures from Czech Republic : expenses 44 billion CZK p.a., total cost till now 200 billion CZK

Contracted : 7000 MWh the same as full needs in the summer 2 CZK/kWh exchanged for 14 CZK/kWh

If it would be happen : How many weeks will be needed till collaps of Czech economy will occur?

Common sense will probably think in Czec Republik about economy sabotage

Energy market

1. During last 7 years the average price in EU raised for electricity as much as 37%
2. The volatility of CO_2 emissions prevent any realistic long term investment
3. Financial capital provides liquidity on the market. Free access of financial capital change the volatility profile of energy market
4. It is believed that total share of financial capital on commodity markets should not exceed 35% of the total volume (Masters et al.)
5. The result: investment environment on energy market is unstable due financial capital acting on energy and emission market hence **prevents investments**

Case Study No3 Pension reform in Slovakia

Reason for transformations of Pay – as – you – go system in Slovakia:

1. Dependency ratio in long term horizon will fall down into unstable situation within 20 to 25 years starting 2000
2. The mean life expectancy extended by 8 years comparing to 50ties
3. Women lives 8 years longer than men and women with children lives longer than women without children
4. Free ride problem has been identified (Tragedy of commons)

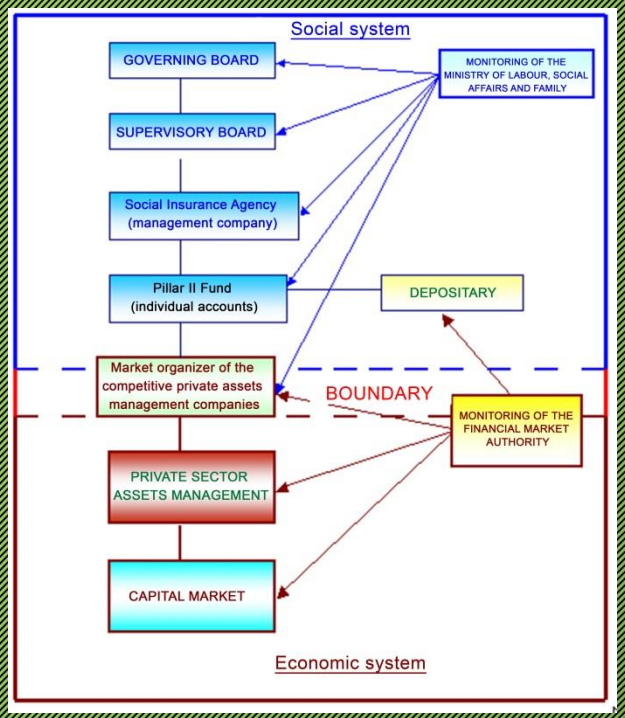
Solution is based on following facts:

1. Shift from 55 years for women and 60 years for men to common retirement age 62 with the next step is interconnect retirement age and mean time of life expectancy
2. In long run (40 years) yield of labor and yield of capital is nearly the same between 2% to 3% real returns p.a. – risk could be splitting equally between yield of labor and yield of capital we suggested to split pension system with ratio 9%:9% as income Pillar I and Pillar II
3. Individual accounts covered with assets should serve as vehicle to financially cover 50% expenses . Accounts should serve for individual intergeneration transfer within three generation family. This is the key in order to solve : 1. free ride problem 2. support creation family and their long term sustainability. This solution could positively influence also labor market

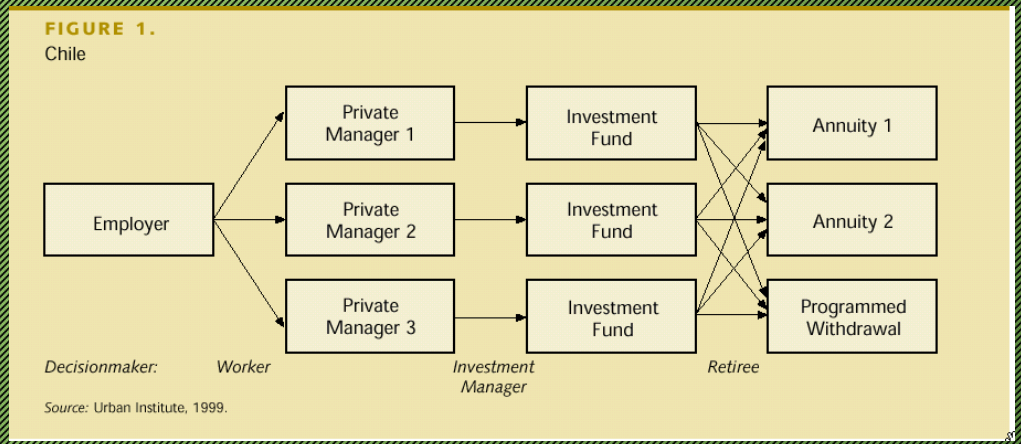
Case Study No3 Pension reform in Slovakia

Legislative Intent 2002

Model A
Adjusted model from Canada

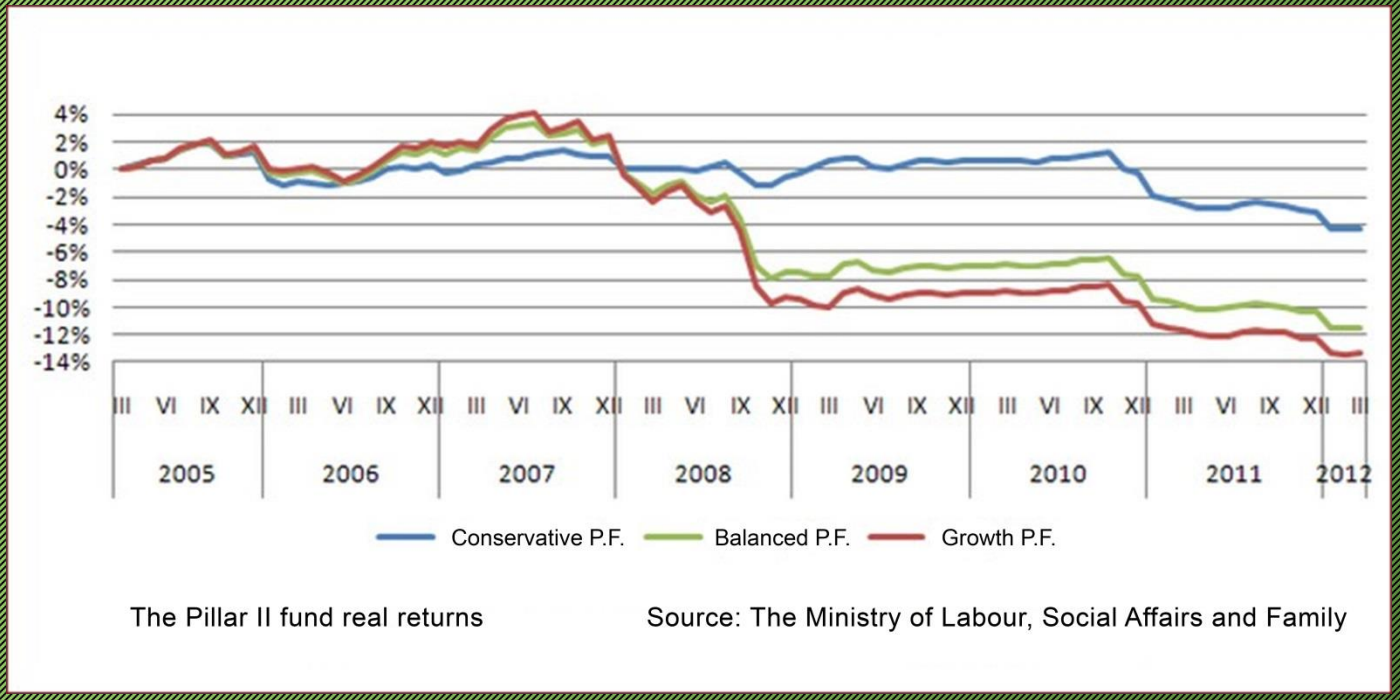


Model B
Adjusted model from Chile



Case Study No3 Pension reform in Slovakia

Realized Model B of Pillar II and results since 2004



The Pillar II fund real returns

Source: The Ministry of Labour, Social Affairs and Family

Case Study No3 Pension reform in Slovakia

Profit/loss calculation in Pillar II funds against inflation and against conservative annual returns of 2% and OECD model of 3% annual returns.

31st of December 2011	Asset value net		Amount od monthly payment to asset manager	Profit/loss against inflation	Value of assets	Value of 1% assets	Value of assets, unless evaluated by inflation	Loss	Loss with 2% appreciation		Loss with 3% appreciation	
Parameter	million €		%	%	%	€	€	€	%	€	%	€
	Net value of assets in a conservative fund											
	53,00	AEGON	0,025%									
	130,20	Allianz	0,025%									
	153,80	AXA	0,025%									
	36,40	Poštová banka	0,025%									
	34,60	ING	0,025%									
	99,30	VÚB	0,025%									
	507,30	**SPOLU**		**-4,3**	**95,7**	**5,30**	**530,09**	**- 22,79**	**-18,75%**	**- 99,37**	**-26,58%**	**- 140,91**
	Net value of assets in a balanced fund											
	119,60	AEGON	0,025%									
	483,50	Allianz	0,025%									
	310,90	AXA	0,025%									
	72,60	Poštová banka	0,025%									
	169,30	ING	0,025%									
	242,40	VÚB	0,025%									
	1 398,30	**SPOLU**		**-11,5**	**88,5**	**15,80**	**1 580,00**	**- 181,70**	**-26,35%**	**-416,33**	**33,87%**	**535,15**
	Net value of assets in a growth fund											
	325,40	AEGON	0,025%									
	940,90	Allianz	0,025%									
	837,70	AXA	0,025%									
	158,80	Poštová banka	0,025%									
	329,50	ING	0,025%									
	363,90	VÚB	0,025%									
	2 956,20	**SPOLU**		**-13,4**	**86,6**	**34,14**	**3 413,63**	**- 457,43**	**-28,00%**	**-955,82**	**35,84%**	**1 223,44**
31st of December 2011	**4 861,80**	**Pillar II funds total**					**5 523,72**	**- 661,92**	**- 1 471,52**		**1 617,68**	
Average loss in %								**-11,98%**	**-30,27%**		**33,27%**	

Case Study No3 Pension reform in Slovakia

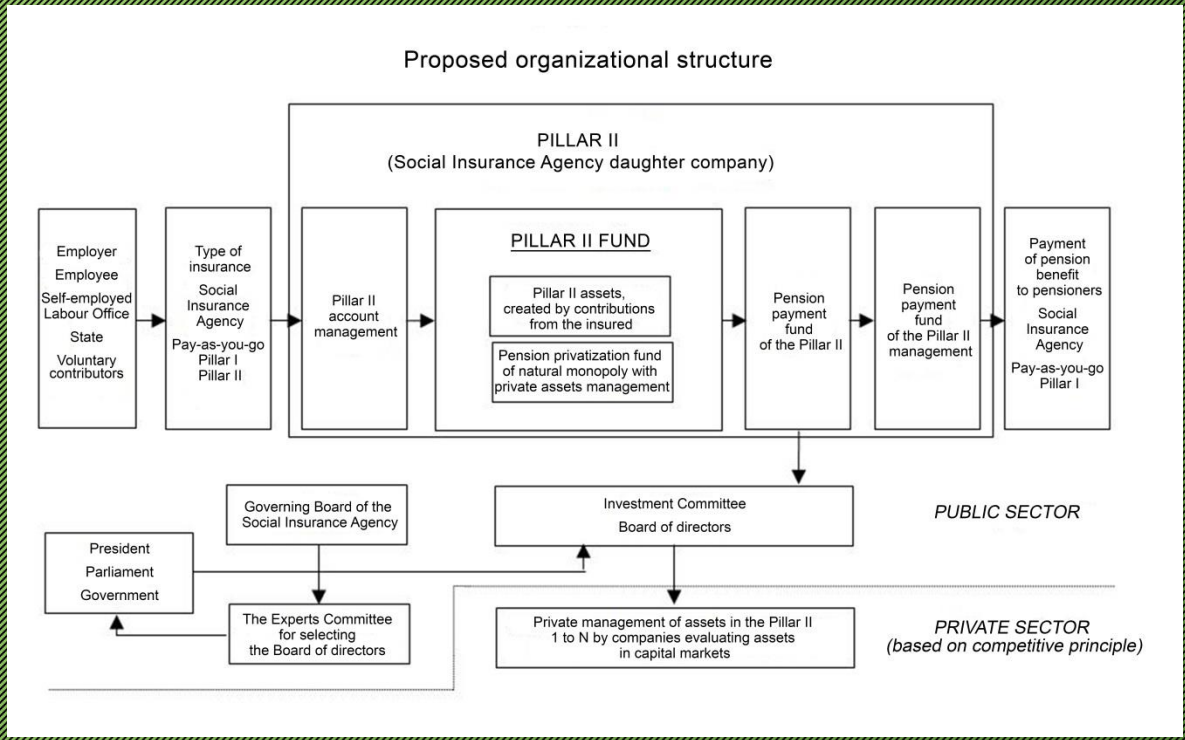
Roots of the loss of Model B

1. There is no market for account management – economy of scale is not been fully exploited
2. Unproductive marketing expenses as much as 500 mil.€ must be recovered
3. Conflict of interest squeeze down the yield
4. Analysis proved that there was no free choice – the Gaussian distribution is damaged substantially
5. It brings inequality between people as much as 35% in extreme in pensions income
6. The distribution of functions between public finance and private sector do not allow to put effective guarantee in which asset manager guarantee to state and state to insured persons
7. There is no effective competition between asset management – all have more less the same results
8. Because account management belongs to private sector Pillar II create state debt even assets are used to cover 50% of the future pensions hence interest on state debt bonds is rising

Model A of Pillar II

Basic advantages:

- Account management and asset management are separated
- Account management could fully exploit economy of scale as the cost added to Social security is no more than 0,1 to 0,3 % from assets
- There is real competition in asset management
- Individual accounts are fully covered via asset
- There is no more rising state debth since accounts are within public finance managed by private sector
- State could give effective guarantee on accounts of Pillar II the same way as in Pillar I
- Three intergeneration individual transfer could be implemented in order to solve free ride problem
- Insurance and solidarity principles could be embedded in the Pillar II the same way as in Pillar I



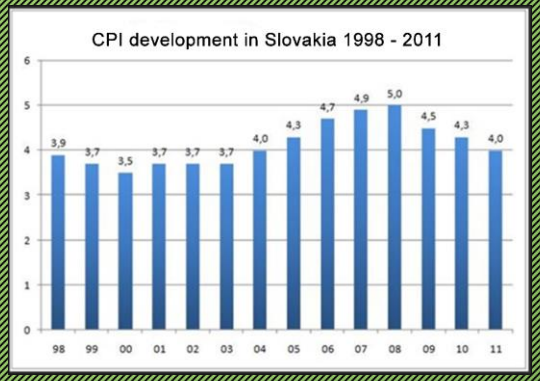
Resources needed for 40 years transformation of the pension system

In 2001 and 2002 the privatization of Slovak Gas Company and other companies from energy infrastructure sector starts
Developed model showed that removing cross subsides for domestic supply of natural gas means that value of the SPP should double within next 4 years
Recommendation 2001: do not sell the shares rather transfer them into Pillar II directly with the result of doubling resources needed for transformation comparing to selling price
In 2002 the 49% shares of SPP has been sold to investors for 2,7 billion €
Dividends paid to investors between 2003 to 2013 (10 years) 3,5 billion €
The value model from 2001 of SPP has been proved and paid dividends showed that the value doubled
Selling price to second investor 2013 : 2,6 billion €
Assets in Pillar II : 5,5 billion €
State debt raised due to this transaction of amount 2,8 billions €
Instead of Slovak citizens rather rich energy companies from EU have money which are fully paid by Slovak consumers in a way of removing cross subsides
It has been discovered that valid regulations has been damaged during privatization procedure

Should we understood that these are values upon EU is build?

Corruption Perception Index of Transparency International SPP case

Year	Inflácia	CPI TI index	Paid dividends (49% shares) billion SKK
2002		3,7	
2003		3,7	
2004		4	
2002-2004	20,60%		22,1
2005	2,70%	4,3	9,75
2006	4,50%	4,7	20
2007	2,50%	4,9	12
2008	4,60%	5,0	10
2009	1,60%	4,5	12
2010	1%	4,3	12
2011	3,90%	4,00	9,5
Average inflation 2002-2011	**4,14%**		
Average CPI TI 2002-2011		**4,79**	
Paid dividends (49%) 2002-2011 bill. SKK			**107,35**
Averaged paid dividends per year (49%) bill.SKK			**10,735**



	Real data 2002-2011	Real data 2002 -2011 + CPI TI	Selling price 49% shares bill.SKK
Discont	**0,0444**	**0,0923**	
Cost of borrowed capital 5% pa	*0,05*	*0,05*	
Income tax 19%	*0,19*	*0,19*	
share of borrowed capital 40%	*0,40*	*0,40*	
Alternative cost of own capital			
systemic averadge risk 6,0%	*0,06*	*0,06*	
specific risk of SPP 2%	*0,02*	*0,02*	
specific risk of regulation 2,0%	*0,02*	*0,02*	
Average inflation 2002 -2011	*0,0414*	*0,04*	
State bonds yield 3,6%	*0,036*	*0,04*	
Model perpetuity price of 49% shares SPP bill.SKK	**241,78**	**116,31**	**120,9**
Difference between selling price and models in bill.SKK	**120,88**	**-4,59**	
Difference between selling price and models in %	***99,98%***	***-3,80%***	

Selling price as tender bill.€	3,05
Real selling price bill.€	2,745
Rate loss mil.€	376
Dividendy paid bill.€	3,5

Loss SR = ((241,78 SKK/120,9 SKK)x 3,05 bill.) – 2,745 bill.= 3,35 bill.€

Eurofunds in Slovakia

2007 – 2013 Euro funds allocated to Slovak Republic: 11 631 bill.€

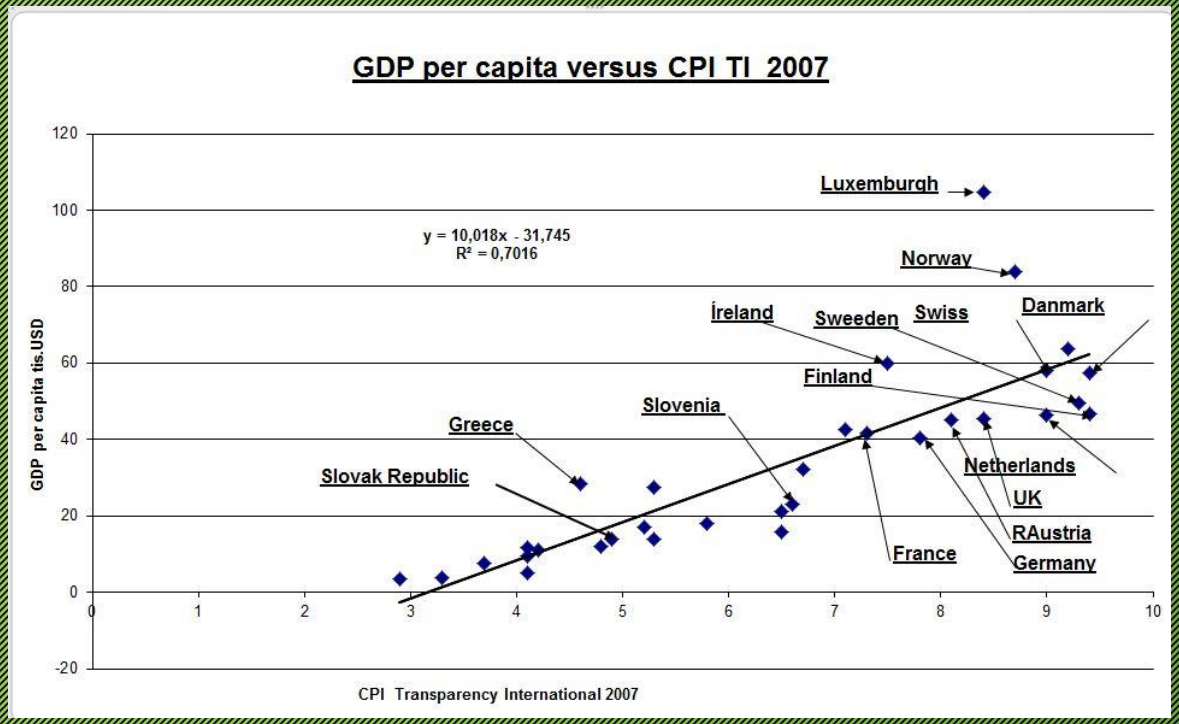
Association of entrepreneurs of Slovakia disclosed that in order to get contract they pay in average 13% of the contracted amount

Psychology and audits as well indicates that the value is double
EU Commission offsets around 7% of the allocated amount

We can estimate that about 20% of them are ineffective allocate due to corruption
Total: 25 + 7 + 20 = 52% ineffectiveness
CPI TI during 2007 to 2013 = 4,38 (for the years 2012 and 2013 TI 4)

The estimated effective use is 48% comparing to CPI TI 43,8% provides reasonable accuracy

GDP per capita versus CPI TI



State	CPI TI	GDP per capita € tous €
Denmark	9,4	57,261
Finland	9,4	46,602
Sweden	9,3	49,655
Iceland	9,2	63,83
Netherlands	9	46,261
Switzerland	9	58,084
Norway	8,7	83,922
Luxemburg	8,4	104,637
UK	8,4	45,575
Austria	8,1	45,181
Germany	7,8	40,415
Ireland	7,5	59,924
France	7,3	41,511
Belgium	7,1	42,557
Espania	6,7	32,067
Slovenia	6,6	22,933
Estonia	6,5	15,851
Portugall	6,5	21,019
Malta	5,8	18,088
Cyprus	5,3	27,327
Hungaria	5,3	13,762
Czech Republic	5,2	17,07
Slovak Republic	4,9	13,857
Litva	4,8	11,985
Greece	4,6	28,273
Poland	4,2	11,041
Bulgaria	4,1	5,186
Croatia	4,1	11,576
Turkey	4,1	9,629
Romania	3,7	7,697
Bosna a Hercegovina	3,3	3,712
Albania	2,9	3,354

Concluding remarks

1. Transformation of the building without any subsiding towards NET zero energy building shows:
   - Energy savings as much as 87% of primary energy
   - 96% of carbon emission
   - Possibility to reach Net zero energy balance and surplus of 350 MWh per year to energy networks
2. Social cost of carbon has been identified as new value suitable for energy market transformation
3. No market rather regular transformation is needed in order to squeeze down carbon emission
4. Knowledge curve for Green Certificate has been developed as a suitable tool for technology selection
5. Energy market should pay energy and Green Certificate delivered to the market
6. Regular transformation rise price of electricity 1% p.a. and 0,3% in natural gas
7. Energy infrastructure should serve as a pension financial back up in transformed pension system
8. Transformation of the PAYG into Pillar I and II should allocate account management in public sector and asset management in private sector. Such construction keep solidarity . State can put the same level of guarantee on accounts of Pillar II as in Pillar I
9. Under cyclic crises non recovery transformation process with value change has been identified
10. Corruption creates limit in progress of economy based on innovation measured GDP
11. Proper psychology should be impose in order to solve the discrepancy between standard of living and quality of life reported by people

Concluding remarks

- Transformation towards sustainable society based on renewable energy at least possible cost seems to be the answer to this crises.
- The next future period will be challenging and inspiring in its nature. With reasonable probability eco(renewable, nano and bio) technologies will solve most of the present problems within estimated next 10 -15 years

Basic assumption :
The human being must be transformed itself since corruption seems to be the limit of such transformation

What values will EU adopt depends only on EU citizens

5th European Innovation Summit

Unchain Europe's Innovation Heart - 5 Calls to Wake Up Europe!

30 September - 3 October 2013
European Parliament,
Brussels

knowledge 4 innovation

Thank you for your kind attention

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