

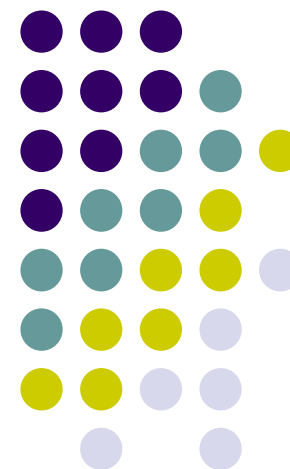


1959 - 2009

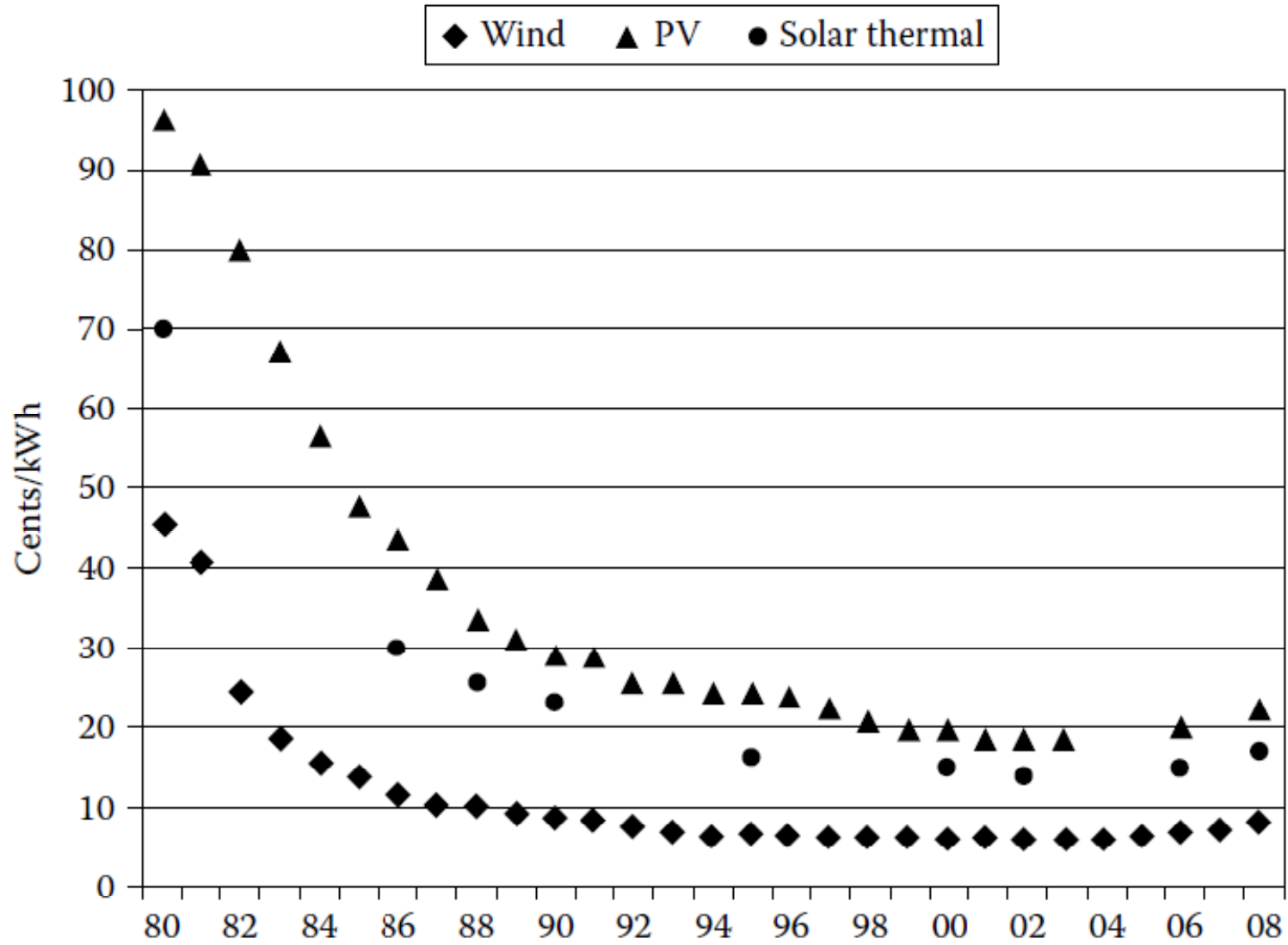
Macedonian legislation on Energy Efficiency and RES

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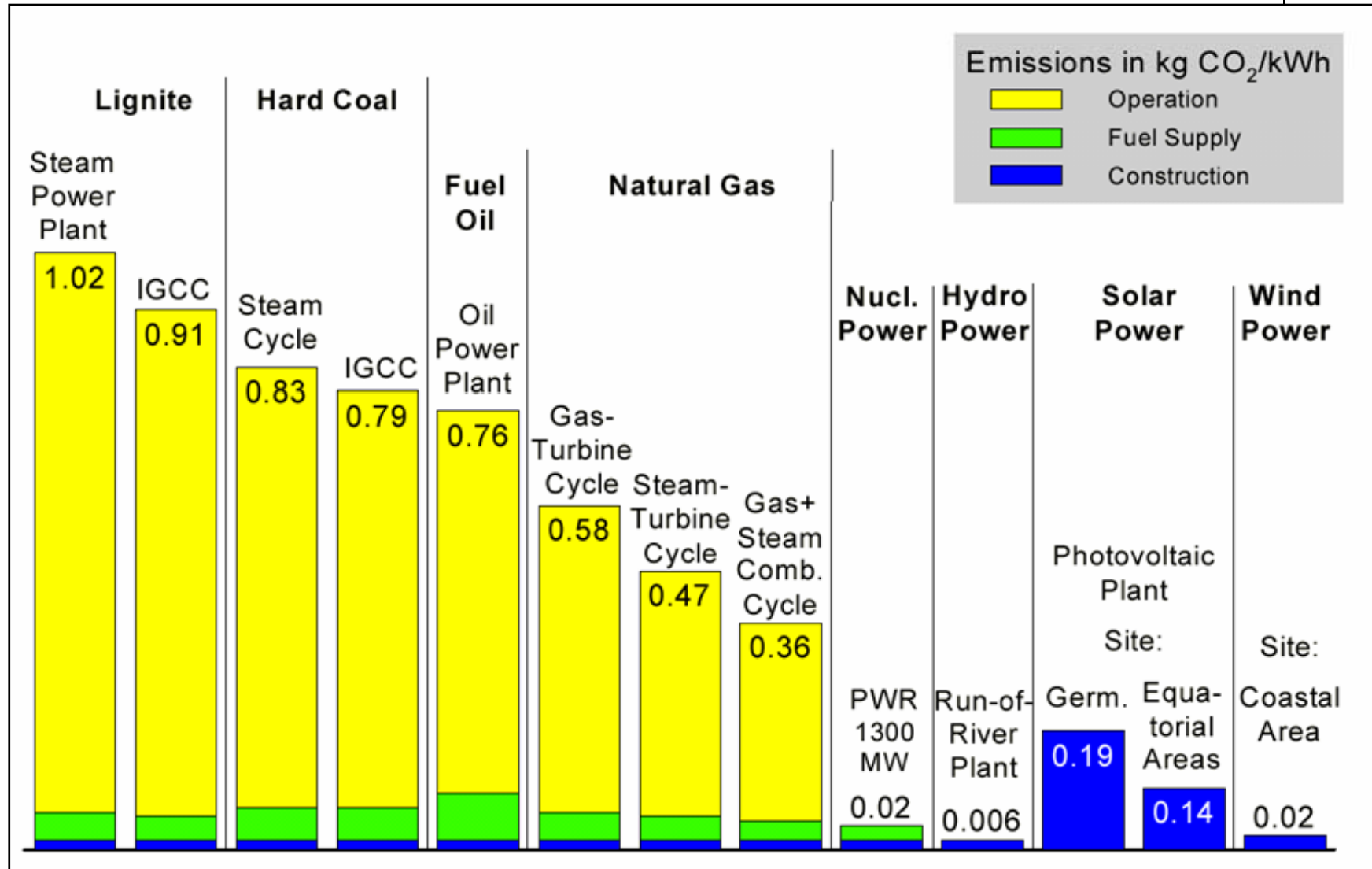


Renewable Energy Cost Trends





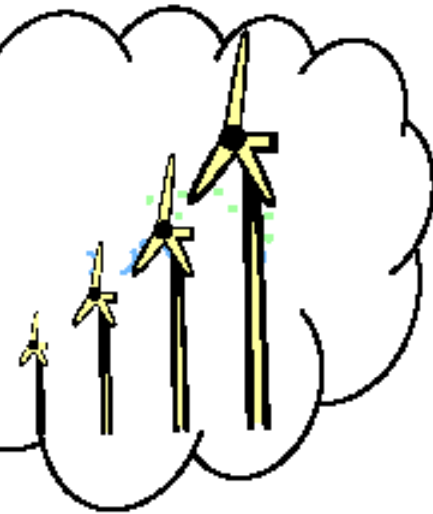
Emission and RES in SE Europe

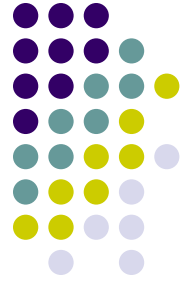




This is the sort of market we want

CO ₂ Prices	
2006	12.5
2007	13.2
2008	14.4
2009	15.1
2010	15.8
2011	16.5
2012	17.9





EU directives for RES & EE

- Directive 2001/77/EC and 2009/28/EC for promotion of the electricity produced from renewable energy sources (RES)
 - 20% of energy production should be from RES
 - to diversify the mix of primary energy resources
 - to become the world's most energy-efficient region
 - to become the world leader in low-carbon energy research and development



Top 10 Electricity consumer/per capita

# 1	Iceland :	31,147.292 kWh per capita	2006	
# 2	Norway :	24,011.233 kWh per capita	2006	
# 3	Finland :	16,850.372 kWh per capita	2007	
# 4	Canada :	16,279.411 kWh per capita	2006	
# 5	Qatar :	15,938.943 kWh per capita	2006	
# 6	Kuwait :	15,210.945 kWh per capita	2006	
# 7	Sweden :	14,769.403 kWh per capita	2006	
# 8	Luxembourg :	14,604.742 kWh per capita	2006	
# 9	United States :	12,924.224 kWh per capita	2007	
# 10	United Arab Emirates :	12,483.568 kWh per capita	2006	



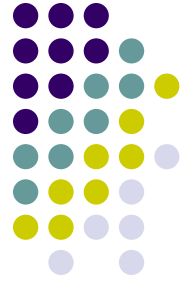
# 55	Greece:	5,037.348 kWh per capita	2006	📊
# 56	Falkland Islands (Islas Malvinas):	5,015.167 kWh per capita	2006	📊
# 57	Kazakhstan:	5,000.35 kWh per capita	2007	📊
# 58	Greenland:	4,997.006 kWh per capita	2006	📊
# 59	Bulgaria:	4,857.761 kWh per capita	2006	📊
# 60	Slovakia:	4,828.587 kWh per capita	2006	📊
# 61	Portugal:	4,584.665 kWh per capita	2006	📊
# 62	Malta:	4,568.025 kWh per capita	2006	📊
# 63	Serbia and Montenegro:	4,521.068 kWh per capita	2003	📊
# 64	Macedonia, Republic of:	4,207.859 kWh per capita	2007	📊
# 65	Oman:	4,013.805 kWh per capita	2006	📊
# 66	Ukraine:	3,905.852 kWh per capita	2006	📊
# 67	Malaysia:	3,724.977 kWh per capita	2006	📊
# 68	Hungary:	3,690.242 kWh per capita	2006	📊
# 69	Croatia:	3,508.601 kWh per capita	2006	📊

4,2 MWh per capita



Macedonian legislation

- Law on Energy, Assembly of the Republic of Macedonia, Official Gazette of the Republic of Macedonia no.63/06, 2006
- Law Amending the Law on Energy, Assembly of Republic Macedonia, Official Gazette of the Republic of Macedonia no.106/08, 2008
- Chapter 12 - **Energy efficiency and renewable energy sources** (Article 121-142)
- A new Law on Energy is expected very soon



Some definitions....

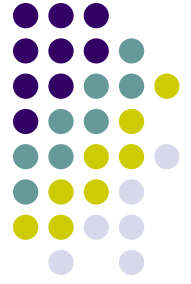
- **Energy efficiency** is a set of measure by which application is achieved reducing of energy consumption, (with the same level of comfort in facilities for living and working) and reducing the energy consumption per unit of product in the industry with the same quality and quantity
- **Services for Energy Efficiency** are activities related to examinations, consulting, research, design, construction, installation, modernization, maintenance, management and monitoring of machinery, equipment and buildings, leading to reduced energy consumption by keeping or increasing the comfort of living
- **Evaluation of Energy Efficiency**
- **Management of energy efficiency**



The main players

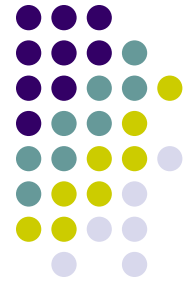
- **Government of the Republic of Macedonia**
 - Ministry of Economy
 - Ministry of environment and physical planning
 - The Strategy for Energy Efficiency
 - The Strategy for Renewable Energy Sources
 - **Energy Agency of Republic of Macedonia**
 - **Energy Regulatory Commission of the Republic of Macedonia**
 - Bylaws, Licence, Energy Price Regulation

Energy efficiency legislation



- Regulations for Energy Efficiency of buildings (OG of RM, no.143 from 13.11.2008)
 - Estimation of the energy efficiency
 - Estimation of Energy consumption for each housing facility and influence to environment
 - Certificate for fulfilment of the requirements regarding to the energy efficiency

Rules for marking the energy efficiency of appliances in households

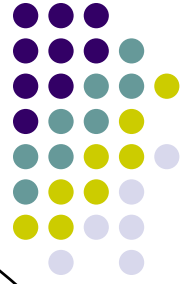


Енергија Производител Модел	Logo ABC 123
Повеќе ефикасен 	
Помалку ефикасен Потрошувачка на енергија kWh/год. <i>(Заснована на стандардни тест резултати за 24 h)</i> Зистинската потрошувачка на енергија ќе зависи од начинот на користење на уредот и неговата местополжба	XYZ
Простор за свежа храна ℓ Простор за замрзната храна ℓ	xyz xyz
Ниво на бучаза (dB(A) за 1 pW)	xz
Дополнителни информации се содржани во техничкиот просpekt EN 153:2006 Правилник за означување на енергетската ефикасност на уредите за домаќинствата	

- I
- II
- III
- IV
- V
- VI
- VII
- VIII
- IX
- X



Renewable ENERGY SOURCES



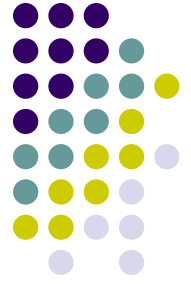
BIO ENERGY

**GEO
THERMAL
ENERGY**

**HYDRO
ENERGY**

**WIND
ENERGY**

**SOLAR
ENERGY**



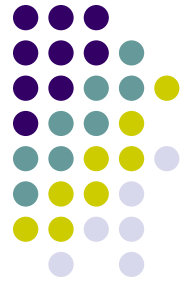
Regulations...

- **Rules for renewable energy sources for electricity production**, the Ministry of Economy, Macedonia, Official Gazette no. 127/08, 2008;
- **Rules for acquiring the status of privileged producer of electricity from RES.....**, the Ministry of Economy, Macedonia, Official Gazette no. 29/08;
-



Small Hydro Power Plants				
Block	Annual quantities of delivered electricity [kWh]		Feed-in tariffs [€cents/kWh]	
I	1 – 1.020.000		12,00	
II	1.020.000 – 2.040.000		8,00	
III	2.040.001 – 4.200.000		6,00	
IV	4.200.001 – 8.400.000		5,00	
V	above 8.400.001		4,50	
Wind Power Plants			8,90	
Electricity generation from biogas				
Group	Installed capacity			
I	≤ 500 kW	≤ 1000 kW	13,00	11,00
II	> 500 kW	>1000 kW	11,00	9,00
Photovoltaic				
Group	Installed capacity			
I	≤ 50 kW		46	38,00
II	> 50 kW		41	34,00

Limits for subsidized installed capacity in RES – OG of RM 123/09



- HPP up to 10 MW by area (no summary limit)
- Wind Power Plants – up to 50 MW (maximum summary up to 150 MW will be subsidized)
- Photovoltaic power plants – up to 1 MW
 - Units up to 50 kW: total capacity 2 MW
 - Units Form 50 kW – 1 MW: total capacity 8 MW
- KOGE plants up to 3 MW (total capacity with privileged tariff – 10 MW)
- Biogas up to 500 kW – total 2 MW
 - from 500 kW – 2 MW total 8 MW



Conclusion

- Macedonian Legislation should be in function to improve Energy Efficiency and to support energy produced from RES
- Economical effects from energy efficiency practice should be evident
- The feed-in tariffs for RES in Macedonia should be in correlation with national GDP and economical power of the people



50 години

ФАКУЛТЕТ ЗА ЕЛЕКТРОТЕХНИКА
И ИНФОРМАЦИСКИ ТЕХНОЛОГИИ
Скопје



1959 - 2009

Renewable
Energy



**THANK YOU FOR YOUR
ATTENTION**

