



**Energy economic context in Turkey:
why & how to Combine Tariffs Reform
&
Energy Efficiency policy measures,
*to make both easier!***

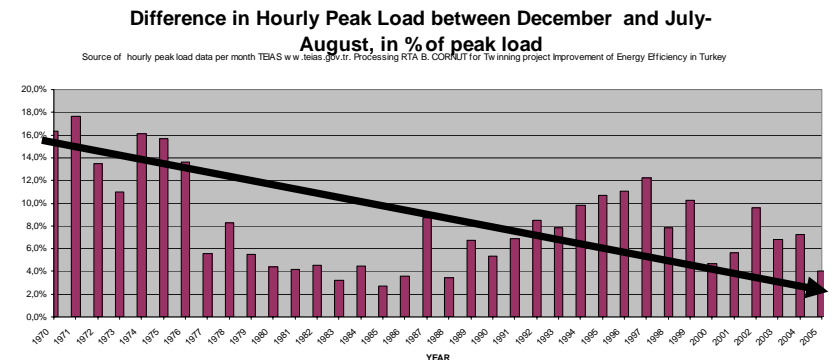
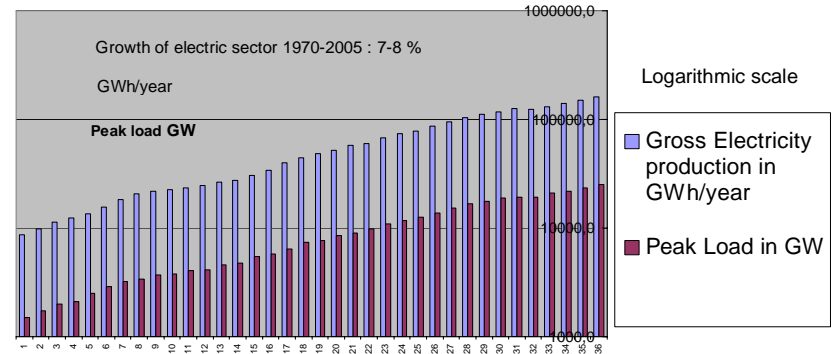
**Bernard CORNUT, RTA
Closing Event 20 Nov. 2007**

Sequence

- **Problems in Supply of Electricity**
- **Present Tariffs of Electricity**
- **Uncertain Future in Transition Period**
- **Policy Options & Risks Mitigation**
- **Mix of Solutions & Synergy : EIE has something to say....:**
- **Energy Efficiency must be a key part within the Energy Policy**

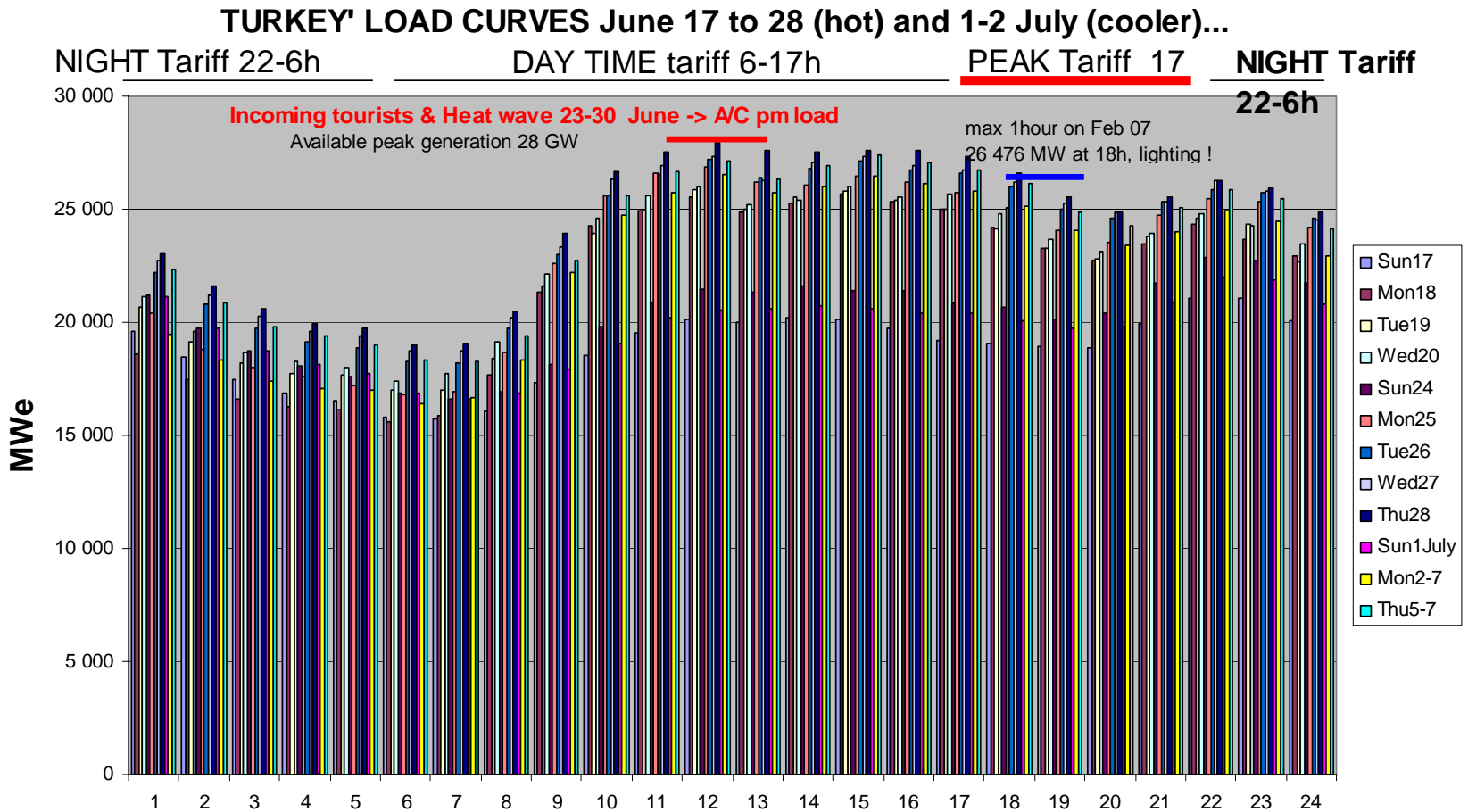
Electricity: Demand increases but new generation is delayed

- Demand for electricity increases strongly 8% in kW & kWh (e.g. for air conditioning systems)
- Supply from hydropower was low in 2007 (less rains)
- Summer 2007 showed a shortage of electricity supply and nearly a power crisis
- Some industrial CHP plants are stopped (gas price increased, electricity price unchanged)
- Private electricity producers want to cut production since it is loss making
- According to most suppliers, tariffs are too low



Winter peak /Summer peak

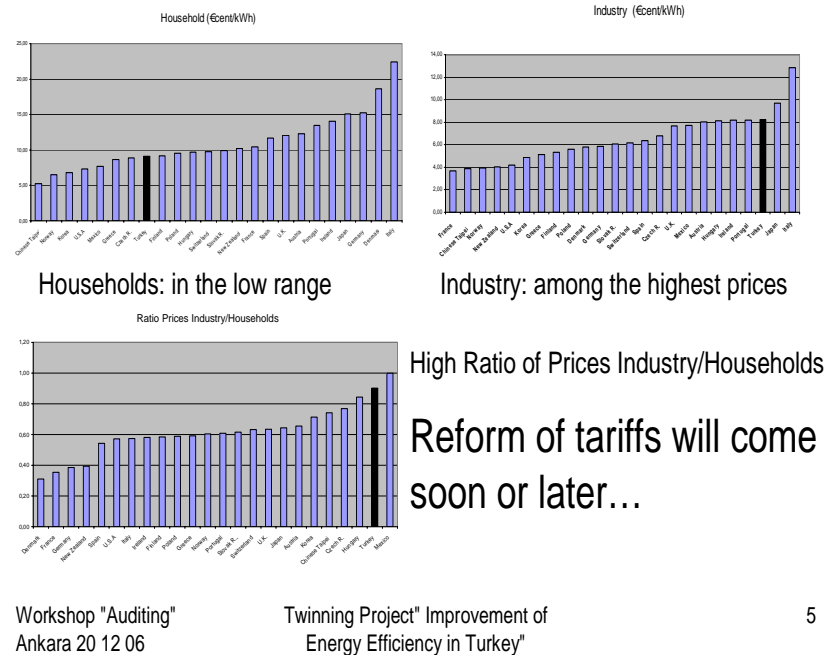
Peak load shifting to summer afternoons due to A/C



Present Tariff of electricity

- Electricity price has not increased since 2003.
- It was a political argument during elections (*zamsiz!*)
- Difference between price for industry & households is too small
- Not raised with inflation, nor raised with increase of oil/gas price
- Households clearly pay too little for energy

Prices of electricity in Turkey & OCDE countries



Uncertain Future in transition period

- Power crises should be avoided
- California crisis had same origin: low tariffs, high generation costs
- Clearly a large need for more electricity generation capacity
- Tariffs need to rise to attract private generation capacity
- Transition period with regulated national tariffs is long & “after transition” is not defined

Policy Options & risks mitigation

- Increase of energy prices is difficult (social/political) but now unavoidable
- Easier if combined with reduced consumption by more end use efficiency
- Total energy bill may increase less, and for social cases may remain the same
- Curbing the growth of demand will reduce risks of power cuts

There are Solutions: EIE has something to say... 1/2

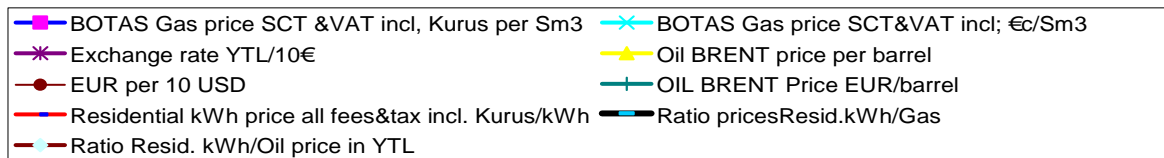
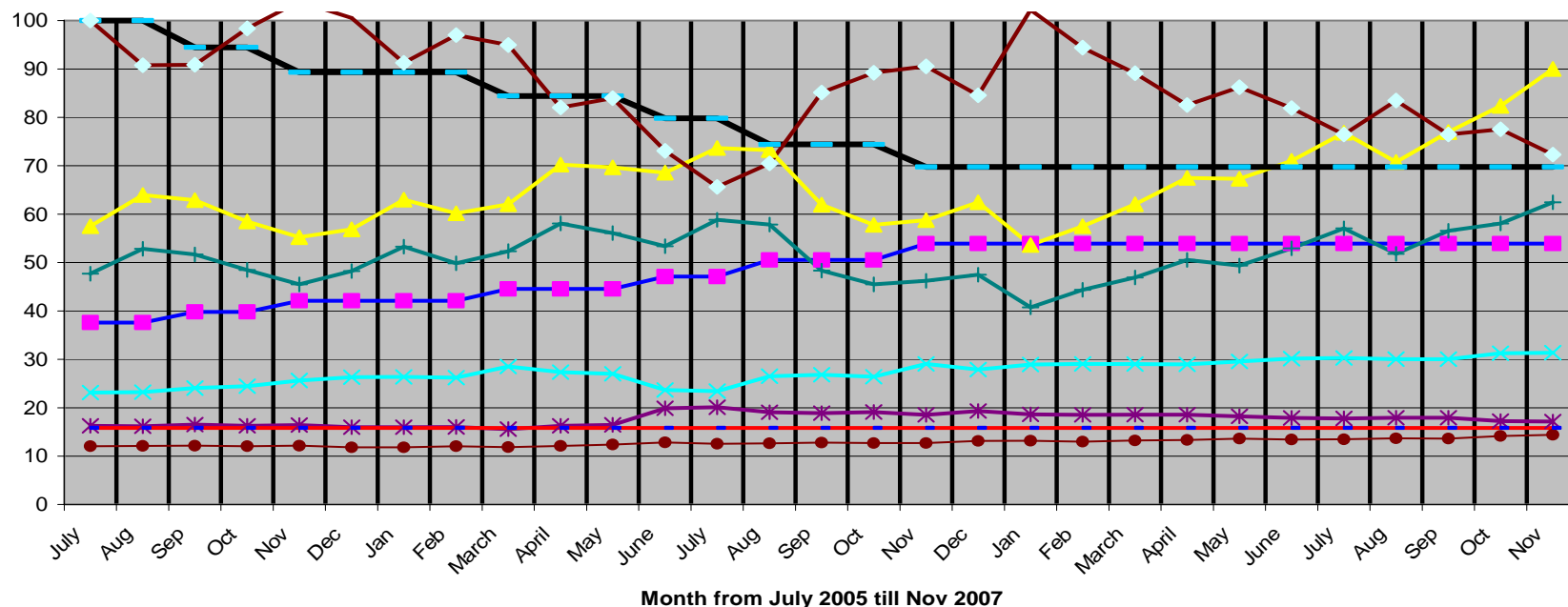
- Combine tariff reform together with Energy efficiency measures, especially for households
- Reform tariff system to regulate demand (power price component – based on kW or kVA - gradually for all users (commercial & residential)= 2 terms
- Change peak hours, consider seasonal periods, lower tariff for consumption up to a ceiling 120?, 150 kWh/month per household) = 2 steps
- Specific measures for low income households?
- Part of the new tariff could be described as an “environmental contribution” allocated to a financial compensation mechanism decentralised at municipal level

There are Solutions: EIE has something to say... 2/2

- EIE has expertise & should propose a system with options & parameters to be negotiated, with reference to socio-economic simulations.
- Saving potential rate is similar to the required increase of tariff. Practical low cost actions can be very effective at short term: replacing old fridges, promoting efficient A/C
- Inserting a request for EE initiatives within the ToR of privatization of energy distribution companies is a chance that EIE must promote
- 20 Regional electric distribution Co: at restart of tenders
- Very soon Ankara gas distribution Co privatised
- New gas Co for Municipalities by EMRA tender.

Over the Project' implementation period July 05. to Nov. 07...

ENERGY COST & PRICES DATA over PROJECT PERIOD July 2005 Nov 2007



Effect of a change of gas price... on thermal rehabilitation of buildings



**During
works**



**New look
&
insulated
Better
Value!**



Cost/benefits of thermal rehabilitation of residential buildings in Ankara

Microsoft Excel - TREE_Th_Energy_Savings_Bldg_Ankara_model_RTAv1A

File Edit View Insert Format Tools Data Window Help

Type a question for help

B2 City

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
2	A	City	ANKARA																					
3	B	Climatic Zone TS825	3																					
4	C	Reference Heating Degree Days TTMD	Average	333	Degree Days																			
5	D	DegreeDays calculated for Meteo file of year	2005	??																				
6	E	Reference Flat living heated area in m2	94	m2/flat																				
7	F	Number of storeys of reference building	5	Floors																				
8	G	Reference specific energy needs																						
9	I	BASE CASE: WITHOUT INSULATION, simple glazing																						
10	J	for heating at 22°C, useful final, calculated by simulation	138	kWh/m2*year	final																			
11	K	for cooling at 24°C indoor, useful final																						
12	L	Boiler & distribution efficiency	67,5%																					
13	K	for heating at 22°C, gross	204	kWh/m2*year	gross																			
14	L	Annual Gas consumption for heating per flat & its cost	19 218	kWh/flat*year	1116	YTL/flat*year																		
15	M	WITH INSULATION at TS825 rev.2006																						
16	N	for heating at 20°C, calculated by simulation	72	kWh/m2*year	final																			
17	O	for cooling at 24°C indoor, useful final																						
18	P	Boiler & distribution efficiency after rehabilitation	73,0%																					
19	Q	for heating at 20°C, gross	99	kWh/m2*year	gross																			
20	R	Annual Gas consumption for heating per flat & its cost	9 271	kWh/flat*year	538	YTL/flat*year																		
21	S	Total Saving rate in % of gross needs without insulation	51,8%		51,5%	check																		
22	T	option (on basis of useful heating energy need in base case without insulation, not strictly cumulative)		Partial Savings %	Specific Heating (final) Need Saving & Need by each single option	Unit price, incl. Installation, from market data	Qty per reference flat (architecture)	Estimated Cost of Investment	Expected Saving YTL/year (heating)	Pay back period (years)														
23	U	Double glazing	12%	16,6	121	130	YTL/m2	13,5	m2	1 755	YTL/flat	124	14,2											
24	V	Wall insulation	28%	38,6	89	35	YTL/m2	84	m2	2 940	YTL/flat	289	10,2											
25	W	Roof Insulation for top flats only	2%	29,0	109	10	YTL/m2	94	m2	940	YTL/flat	21,7	4,3											
26	X	Basement insulation for basement flat only	12%	16,6	121	17	YTL/m2	94	m2	1 598	YTL/flat	124	12,9											
27	Y	Thermostatic valves	3%	4,1	134	240	YTL/flat	1	set p flat	240	YTL/flat	31	7,8											
28	Z	Indoor comfort temp. 20°C instead 22°C as no cold walls	12%																					
29	Af	Combined Savings with all options above, incl. roof + base shar	48%	66	72																			
30	BE	Improving boiler & distribution efficiency, saving % on usefu	8%			200	YTL/flat	1		200	YTL/flat	84	2,4											
31	CC	Collective solar water heater with meters, saving gas	2760	kWh/flat*year		1200	YTL/flat	1	set p flat	1 200	YTL/flat	160	7,5											
32	DC	Average rehabilitation cost per reference flat, excl. solar HW								6 843	YTL/flat	577	9,8											
33	EE	Average rehabilitation cost per reference flat, incl. solar HW								6 843	YTL/flat	738	9,3											
34	FF	Idea, but solar + gas back up replacing an electric water heater (thermosiphon)										436												
35	GC	Average rehabilitation cost per reference flat, incl. solar HW replacing electric water heater								6 843	YTL/flat	1014	6,7											
36	HH	Price of energy (gas, household tariff) see www.ego.gov	Mar-Oct0	0,0492013	YTL/kWh	VAT%KD'	18%			0,058	YTL/kWh tax incl.													
37	II	Price of energy (electricity, household tariff)	March07	0,12406	YTL/kWh	VAT%KD'	18%			0,1581	YTL/kWh all tax incl.													

Price of gas as parameter

Pay back period in years

Sum=73992,65722

Ready

démarrer

Messagerie - Orange ...

Bureau

Act4_8 Closing Event

Microsoft PowerPoint ...

Microsoft Excel - TRE...

FR

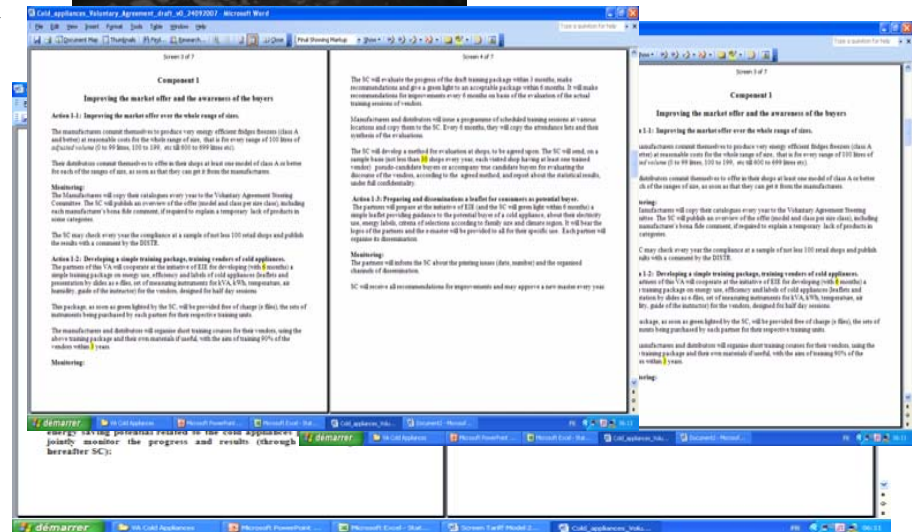
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Effects of gas price on thermal rehabilitation of existing buildings

- If Gas price is 4,92
In Kurus/kWh, as since
Nov. 06
- Pay back period is:
9,8 years
- Nearly no works start
- If Gas price is 8,05
(same increase as oil
increased since Nov.
06, from 55 to 90\$/b)
- Pay back period is:
6 years. Banks may
provide loans, people
cash, works start,
creating local jobs...

A cost effective measure: replacing big & old fridge-freezers by Class A

- Fridge-Freezers use 30-50% of the households electricity
- Fridge-Freezer life 15-20 years
- Old fridge-freezer uses 2 to 3 times more kWh > new class A
- Identifying the worst ¼ part (big old) & replacing by new class A will save a huge qty of electricity
- A draft voluntary agreement is **ready at EIE** for discussion between EIE, white appliances association, Union of Municipalities, Consumers protection associations?



Tea or Coffee, Electricity or Gas?

- 800 Watt x 12 mn = 0,160 kWh/day or 5 kWh/month
- 60 kWh per year
- X 16 000 000 households
- = 2,56 Millions kWh/day from 6h30 to 8h00 that is:
- 1700 MWe = 2 Ankara peak power load.
- If Gas, no additional electric load...
- and thermos keep it warm !!



Conclusion

- Price are a key signal for consumer behaviour
- The bills are the cheapest way to make aware
- A consistent pricing & taxation policy is a powerful & flexible tool for promoting energy efficiency
- **Energy efficiency policy & price policy must go together**

