

# Energy uses in the residential sector

## A road map to savings...



A contribution of the EU\_TR Twinning Project  
*Improvement of Energy Efficiency in Turkey*  
Workshop on Rehabilitation and Building code  
Ankara 11 July 2007 Bernard CORNUT, RTA

# Energy uses at homes

- Space Heating: fuel use depending on building envelop, climate (degree\*days), occupancy, behaviour.., heating system & control
- Hot water : might be gas, kerosene, electric; use depending mainly on number of persons, climate, pricing, life style
- Home appliances : fridge, lighting, TV, washing machine, stand-by, A/C...etc. Use depending on family size, climate, energy class....

# Heating system, Electric Appliances

## Rate of possession of appliances, rel. to Household Income#

For Urban + Rural Households (16446644 in 2002)

### Type of Space Heating system per Class of Household Income

	TOTAL	1st 20%	2nd 20%	3rd 20%	4th 20%	5th 20%
Soba						
Stove	76,9	97,1	91,0	82,5	69,2	44,7
Müşterek, Merkezi						
Common or Central						
Heating	11,9	1,2	5,5	10,8	15,3	26,7
Kat Kaliferi Kombi-						
Individual System	10,1	1,3	3,2	6,1	14,5	25,2
Diğer						
Other	1,1	0,4	0,3	0,6	0,9	3,4

Source: TÜRKSTAT Household Budget Survey 2002 Tab. 7.1 7.2.

	TOTAL	1st 20%	5th 20%	Prov. ref kWh/y	Weighted Kwh/y
Refrigerator	96,4%	91,3%	100,0%	700	675
Freezer	5,8%	0,0%	13,2%	600	35
Otomatic Washing machine	74,4%	41,5%	94,9%	200	149
Air Conditionner	2,7%	0,2%	8,9%	2000	54
Dish Washer	20,0%	2,6%	52,5%	270	54
Waterheater	53,2%	23,6%	73,8%		0
TV	95,2%	87,6%	99,5%	300	286
Video	7,4%	1,2%	19,8%	300	22
Computer	7,6%	0,5%	25,2%	170	13
Internet	2,9%	0,1%	11,7%		0
Hi Fi System	35,2%	16,4%	57,0%	100	35
Electric Oven	41,4%	25,8%	55,4%	200	83
Aspirator	24,9%	5,0%	54,0%	70	17
Stand_By	100,0%			250	250
Lighting	100,0%			200	200
TOTAL per Household					1 873

Source of rates of possession: TÜRKSTAT Household Budget Survey 2002 Tab. 6.1

Source of reference for kWh annual use : Eureco project. Adapted by B. Cornut, provisory

# Making decision to improve...



- Individual decision for changing windows to double glazing, new fridge class A, dual water washing machine.....
- Joint Ownership for thermal rehabilitation, collective solar water heater
- Municipality or association for district heating, urban renovation programmes...

# From Short term to Medium terms

- **Medium Term, Joint Ownership decision:**
  - ---- Thermal Rehabilitation
  - ---- Boiler replacement
  - ---- Cogeneration and District Heating
- **Tariff reform** should push to energy Efficiency... which makes tariff increase socially & politically acceptable...

# Pricing policy together with Energy Efficiency Actions

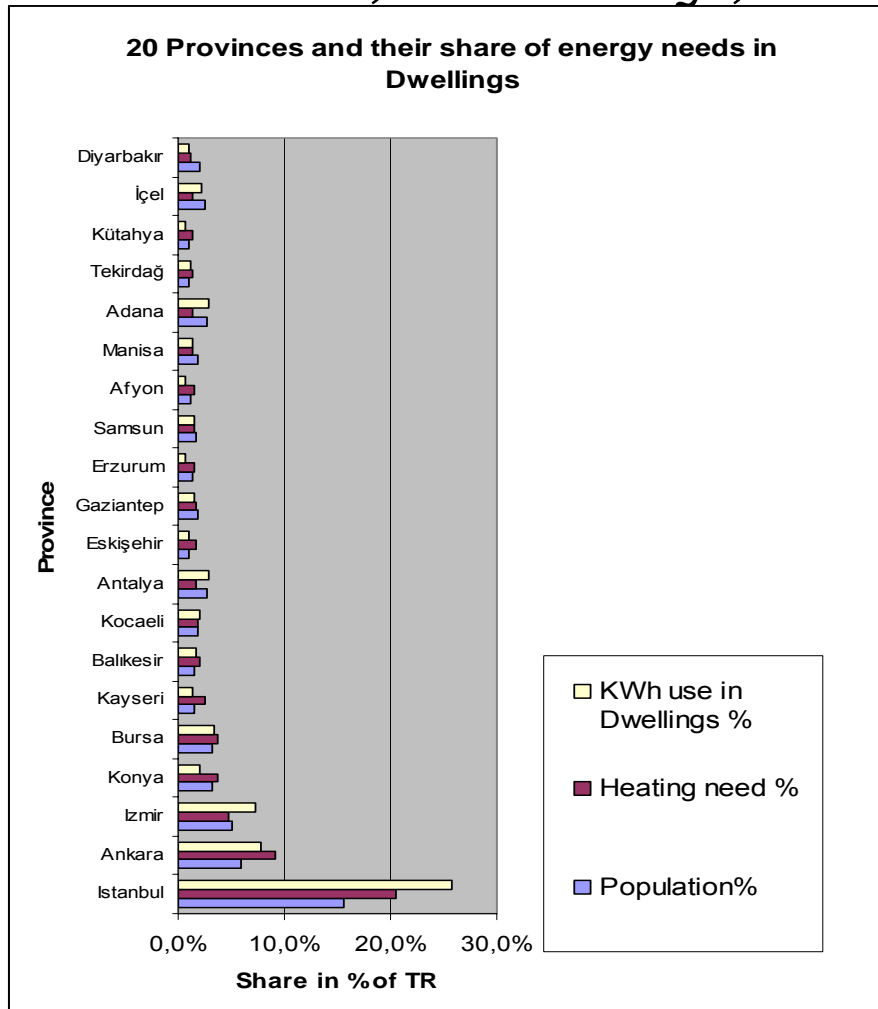
- Oil & Gas prices are increasing
- Electric tariffs need a reform (kVA component to reduce peak load, 3Times of Use, indexation ...)
- Potential gas & electricity savings: 20% to 60%!
- **Short term, individual decision:** Inefficient Fridge replacement by Class A of adequate size. Double glazing windows. Thermostatic valves, Boiler maintenance & control.

# Joint decision & cost sharing...



- Kat Mulkiyet Kanunu, Madde 44: unanimity for works additional to the building.
- It should be 60-80 %. Thermal rehabilitation is for a whole building.
- The amendment should mention if the **no-voting** owners are obliged to pay, or develop a financial mechanism to recover the added value at next sale.
- It is easy to charge heating cost on basis of metering (heat meter, flow meter..)

# Climate, density, economy : Factors



- **The key factors:**
- Number & types of dwellings
- Climate: Degree-days....
- for heating & cooling
- Energy Pricing policy
- Household income level
- Awareness...



# Partnership for rehabilitation: roles to play toward a Voluntary Agreement

Households	<b>Joint Owner ships</b> <b>Citizens Associations</b>	BANKS	<i>Quick &amp; soft loans.</i> <i>Standard contracts.</i> <i>Direct Payment to contractor.</i>
Public sector	<b>Assembly : Law EE</b> <b>Government: Policy</b> <b>Provinces: Priorities</b> <b>Municipalities: Support</b> <b>Meteorology: Degree-days</b> <b>Standards: Certify Quality</b>	Materials Producers	<i>Certified Quality classes. Technical advices to designers, installers and tacheron.</i>
Consultants	<b>Engineers &amp; Architects:</b> <i>Quality charter &amp; Insurance</i> <b>Controllers: Confidence</b> <b>Trainers: improve Technicity</b>	Contractors	<i>Long term Guaranty.</i> <i>Guaranty of performance.</i> <i>Reference costs for designers</i>