

Impacts of Electricity Market Reform



I – Energy, Economic Growth, Economic and Social Benefits (Some Drastical Examples)

// – Low-Income Issues (Under concepts of Universal Service Obligation and Affordability)

/// - International Examples and Application from Turkey



I – Energy, Economic Growth, Economic and Social Benefits (Some Drastical Examples)



Conceptual Approach (E-Energy)

There are three main reasons why a great importance has devoted to energy sector by decision makers and market players;

A- Energy systems are dispensable to meet fundamental needs of society and to support economic development.

B- Secondly, distraction, transformation and use of energy leads to environmental concerns both at regional and global scale.

C- Last but not least, since production of energy asks for long term process at macro level, there is always a need for projection and precaution mechanism.



Conceptual Approach *ii* (MR-Market & Regulation)

According to the economic theory, free market maximizes total welfare of society, but under the presence of natural monopolies in transmission, distribution activities and moreover bottleneck feature of some services lead us to the second best solution instead of free market outcome.

- NATURAL MONOPOLIES
- PRESENCE of EXTERNALITIES
- ASIMETRIC INFORMATION
- PUBLIC GOODS
- PRESENCE of POTENTIAL OLIGOPOLIES-MONOPOLIES



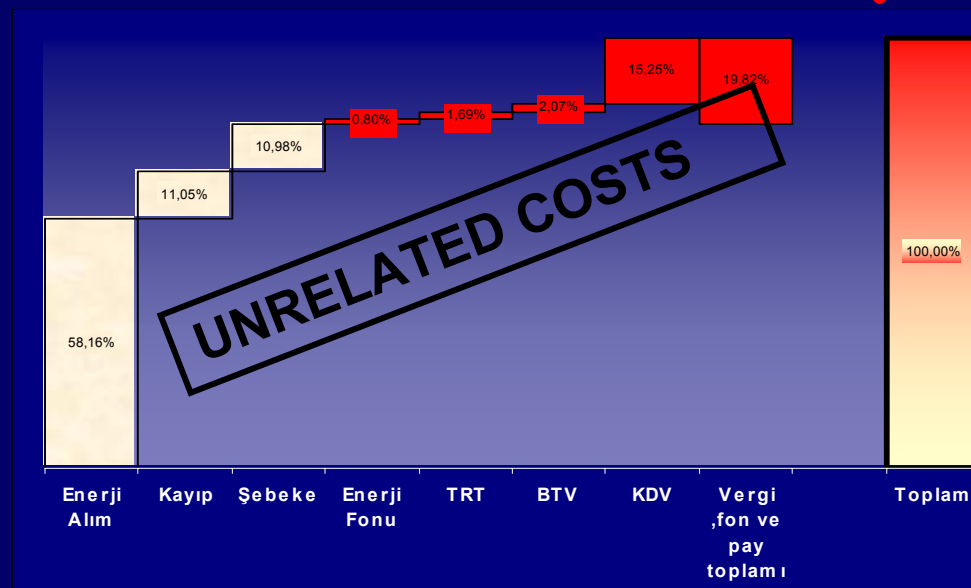
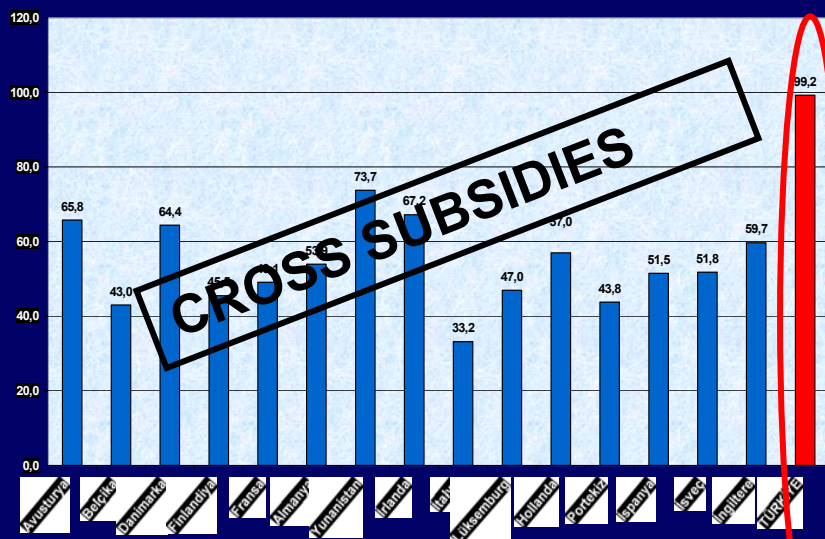
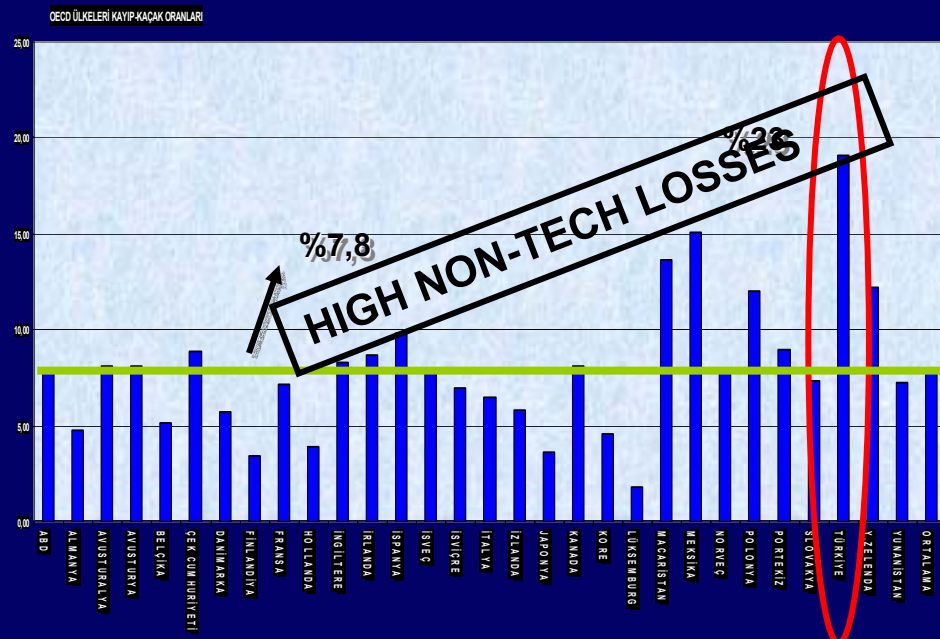
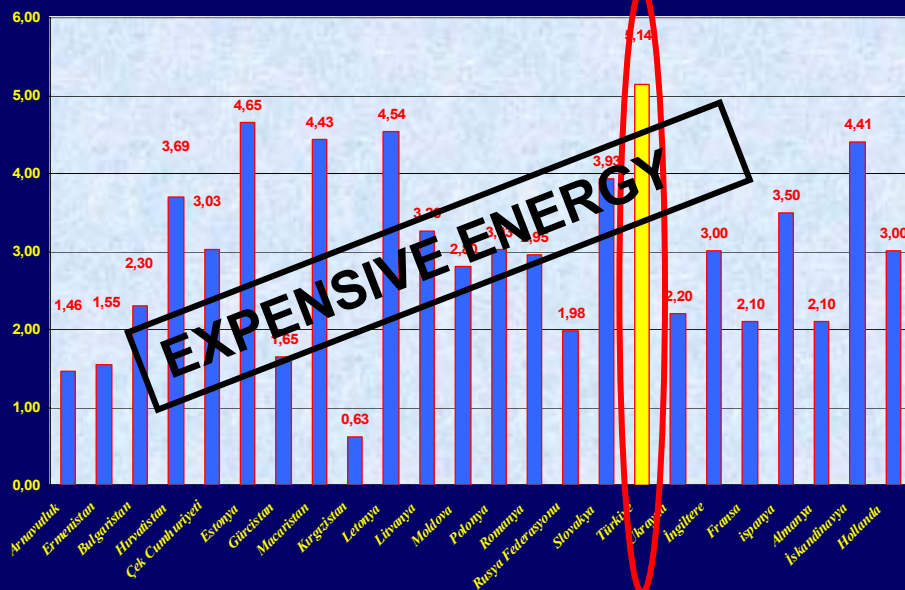
REGULATION

**COMPETITIVE
MARKET**



What Does Make Reform Inevitable?

Toptan Satış Fiyatı (US cent/kWh- 2002 Yılı IV. Çeyreği)





Duration of Reforms

- **Australia** **1991-1998**
- **Argentina** **1992-2001**
- **UK** **1990-1999**
- **Finland** **1995-1998**
- **Sweden** **1996-1999**
- **Germany** **1998-2000**
- **Austria** **1999-2001**
- **Denmark** **1998-2003**
- **Spain** **1998-2003**
- **Holland** **1998-2004**
- **Poland** **1998-2004**
- **Ireland** **2000-2005**
- **Czech Rep.** **2002-2006**
- **TURKEY** **2001-**

AVERAGE: 5 YEARS



Gains of Reforms - I

Price descents in some countries those who have implemented reforms :

		<u>Industry*</u>	<u>Residential*</u>
UK	1992 - 2001	% 36,8	% 25,1
Finland	1995 - 2001	% 36,6	% 29,3
Germany	1998 - 2000	% 38,8	% 23,8
Denmark	1998 - 2001	% 11,7	% 8,4
Portugal	1999 - 2001	% 15,3	% 16,3
		<u>Ave.**</u>	
Australia	1993 - 1999	% 38	
Argentina	1992 - 1998	% 57	

Source: * IEA statistics-Energy Prices and Taxes-1rd Quarter 2001 IEA/OECD Energy Prices and Taxes

** ABD DOE-EIA

TRANSMISSION & DISTRIBUTION LOSSES in SOME COUNTRIES

COUNTRY	1980	1990	1999	2000
Finland	6,2	4,8	3,6	3,7
Holland	4,7	4,2	4,2	4,2
Belgium	6,5	6	5,5	4,8
Germany	5,3	5,2	5	5,1
Italy	10,4	7,5	7,1	7
Denmark	9,3	8,8	5,9	7,1
USA	10,5	10,5	7,1	7,1
Switzerland	9,1	7	7,5	7,4
France	6,9	9	8	7,8
Austria	7,9	6,9	7,9	7,8
Sweden	9,8	7,6	8,4	9,1
Australia	11,6	8,4	9,2	9,1
England	9,2	8,9	9,2	9,4
Portugal	13,3	9,8	10	9,4
Norway	9,5	7,1	8,2	9,8
Ireland	12,8	10,9	9,6	9,9
Canada	10,6	8,2	9,2	9,9
Spain	11,1	11,1	11,2	10,6
New Zealand	14,4	13,3	13,1	11,5
Average	9,5	9,1	7,5	7,5
EU	7,9	7,3	7,3	7,3
TURKEY	12,2	12,3	19,1	19,4

**Losses have
being
continuously
decreased in
liberalized
markets.**

Developments in reserve capacity(%)

Countries	1990	1995	1999
UK	26	21	23
Belgium	26	21	18
France	39	38	37
Germany	25	28	29
Greece	42	32	31
Ireland	32	24	14
New Zealand	29	34	29
USA (N.J., N.Y.)	26	20	16
Turkey	46	36	34

Liberalized markets reserve capacity requirements deteriorated by the effective use of resources.

* **Reserve capacity requirement in Turkey increases to %56 by the end of 2003.**

Electricity Markets, 2002"

Results of Successful Reforms:

- Number of private firms in the market increases
- Foreign direct investments soar
- Contribution to the public budget recovery
- Environmental conditions improve
- Energy prices decrease
- Productivity increases
- Service quality improves
- System operation and reserve capacity develop
- Technical & non-technical losses ameliorate



II – Low-Income Issues (Under Concepts of Universal Service Obligation and Affordability)

Table 4
Relationships between Energy Reforms and Affordability

Affordability Issue	Typical Pre-Reform Condition	Category of Reform	Implications
Fossil fuel prices	Public enterprises that extract, transport, or sell indigenous fossil fuels are often subsidized; consumer prices are controlled; revenues subsidize other government services	Commercialization, privatization, introduction of competition; prices allowed to rise to market levels and price increases passed on to electricity generators	Affordability is diminished to the extent that fuel price increases are passed through to consumers
Wholesale electricity prices	Public enterprises that generate electricity are often subsidized	Commercialization, privatization, introduction of competition; prices allowed to respond to the market	Affordability is diminished to the extent that generation price increases are passed through to consumers To the extent that generation efficiencies from competition are passed through, affordability may be enhanced
Retail electricity prices	Below-cost rates for low-income and rural customers; proceeds diverted to other government services	Commercialization, privatization, introduction of competition often with price caps and customer choice of supplier Form of regulation affects utility incentive regarding end-use efficiency	Retail prices increase for previously subsidized customer classes costs Competition/choice of supplier may hold down rates and narrow margins
Revenue collection	In some countries, customers tap into lines illegally or do not pay for electricity used	Privatization	Improved revenue collection and reduced losses

In Turkey, affordability issues related to fossil fuel prices are relevant for hydro plants.

Source:



Two Different but Equivariant Definitions of Universal Service

DIRECTIVE 2003/54/EC of The EUROPEAN PARLIAMENT & of The COUNCIL

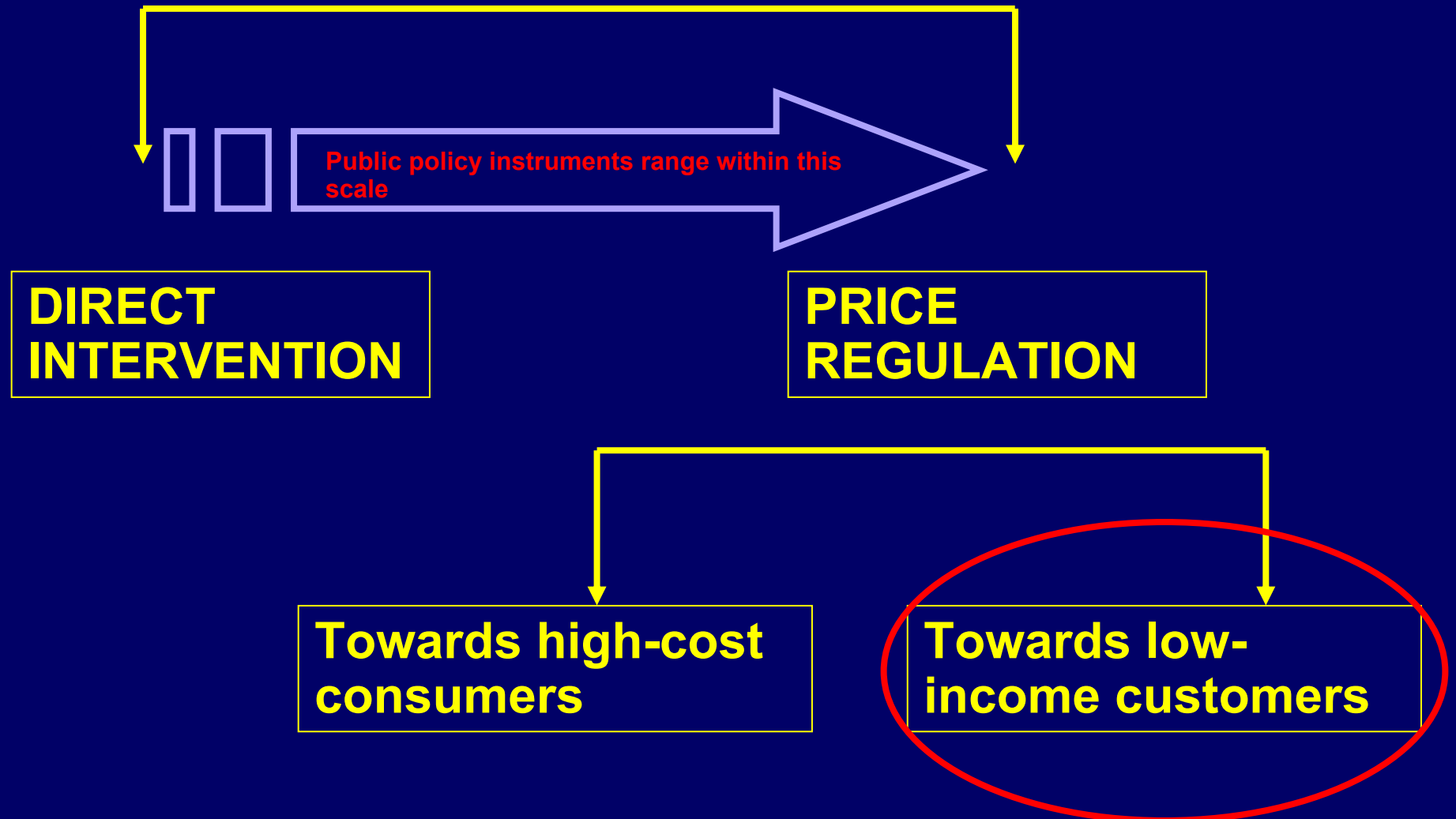
Chapter II, Article 3, Clause 3 says that:

“...universal service, that is the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable and transparent prices.”

The Economics of Universal Service: Theory *

“...the USO can essentially be viewed as the obligation of an operator to offer either a full range or a basic package of service; of good quality to all users at affordable rates.”

PUBLIC POLICY



Subsidy Methods

- Continuity of connection
- Postponement of implementation
- Basic need tariffs
- Price discrimination
- Limiting the burden of invoice
- Other cash transfers based on revenue
- Direct cash transfers

Financing of Subsidies

- Equity of firms
- From cross-subsides (same regions but different customer groups)
- From cross-subsidies (different regions)
- From Cross-subsidies (whole region different customer groups)
- From cross-subsidies (different activities)
- From lump-sum taxes



Selection Criteria (A Theoretical Approach)

This expression provides a simple and operational test for the relative efficiency of the USO compared to the alternative system of cash transfers.

$$\Delta W = (1 + \lambda) \Delta U_r + \Delta U_u + (1 + \lambda) \Delta \pi^m + \Delta \pi^c$$

ΔW = variation in the total welfare

ΔU_u = variation in the surplus of type (u) customer (urban)

ΔU_r = variation in the surplus of type (r) customer (rural)

$\Delta \pi^m$ = variation in the profits of the USO operator

$\Delta \pi^c$ = variation in the profits of the competitors

λ = marginal cost of public funds

If $\Delta W > 0$, then the USO is a more effective instrument of redistribution policy than the direct transfers and vice versa.

Table 3¹¹
Energy Subsidies and Their Costs in Eight Countries

	Subsidy Rate (% of Reference Price)	Efficiency Cost of Subsidies (US\$ billion)	Indicative Budget Costs (US\$ billion)
China	10.9	3.6	29.1
Russia	32.5	6.5	31.2
India	14.2	1.6	9.2
Indonesia	27.5	0.2	1.2
Iran	80.4	3.6	13.2
South Africa	6.4	.01	12.9
Venezuela	57.6	1.2	4.9
Kazakhstan	18.2	.03	1.4

RECOMMENDATIONS FOR SUBSIDIES REFORM

- **Obvious need for reforming the subsidies mechanism in transition countries;**
- **UNECE (United Nations Economic Commission for Europe) made recommendations regarding subsidies reform in transition countries;**
- **These recommendations are not mandatory.**

SUBSIDIES - UNECE RECOMANDATIONS FOR COUNTRIES IN TRANSITION

- **Price signals should reflect the full costs and benefits, including externalities, of supplying and consuming different forms of energy;**
- **Remove any subsidies that fail to achieve demonstrable net environmental or social benefits**
- **Favor regional development, education and training, health and social welfare policies instead of energy subsidies in addressing social issues;**

UNECE RECOMANDATIONS FOR COUNTRIES IN TRANSITION

- Targeted subsidies are preferred:
 - » for clearly defined groups and technologies;
 - » mechanisms that ensure that the benefits of those subsidies go only to those targeted categories.
- Thorough and coherent analysis of all economic, social and environmental associated costs and benefits;
- If it is not possible to assess properly the full implications of a given subsidy, seek to remove it.



UNECE RECOMANDATIONS FOR COUNTRIES IN TRANSITION

- **Prevent the cost of energy-subsidy schemes from becoming a serious burden on the national finances, and abandon any schemes that involve excessive administration costs ;**
- **Full transparency of the financial costs and the channels through which financial transfers, within subsidy programmes;**
- **Limited duration and regular review of energy-subsidy programmes;**
- **Implement reforms in a phased manner.**

UNECE RECOMMANDATIONS FOR COUNTRIES IN TRANSITION

- **Consider introducing compensating measures that support the incomes of poor households in more direct and effective ways than through energy subsidies;**
- **Communicate clearly to the general public the overall benefits of subsidy reform to the economy and to society as a whole;**
- **Cutting-off supplies by energy service providers to non-paying poor households should be applied with care, and under exceptional circumstances .**

III - International Examples and Application from Turkey

A Different Approach

EX-ANTE

CAUSES: central decision making, wrong investments, lack of economies of scale, affordability, geographical differences, bad management, cross subsidies etc.

SOLUTION: National uniform Tariff within the framework of equalization mechanism for clearly pre-specified period of time in order to eliminate huge regional differences.

EX-POST

CAUSES: Affordability, geographical differences, etc. (uncontrollable cost centers)

SOLUTION: Directly revenue support form government as envisaged in the Law (The Electricity Market Law no:4628)



What The Law Says?

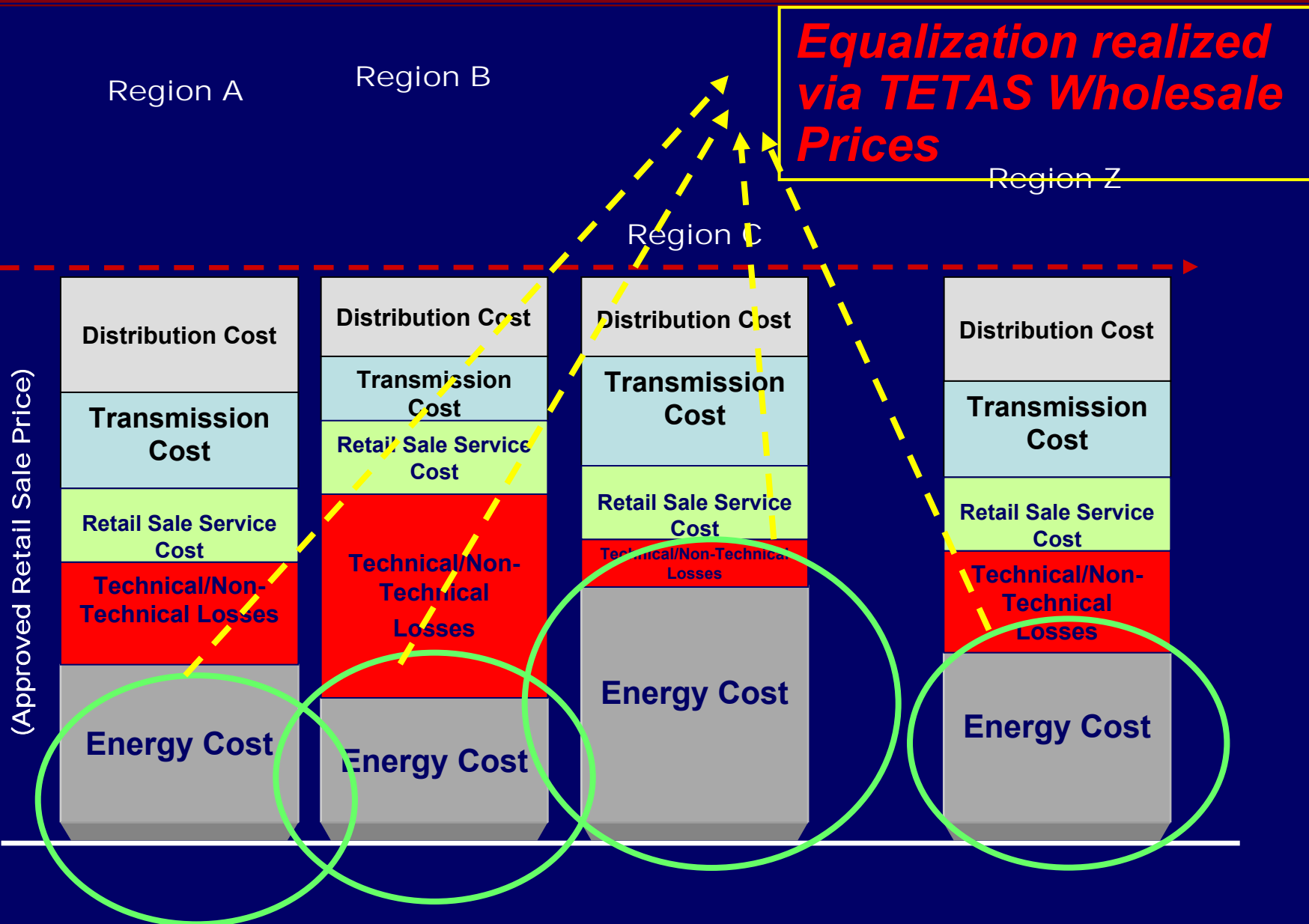
ELECTRICITY MARKET LAW; NO:4628 SAYS THAT:

“In cases where consumers in certain regions and/or in line with certain objectives need to be supported, such subsidy shall provided direct cash refunds to consumers without affecting the prices. The amount, procedure and principles of these refunds shall be established by the Council of Minister upon the Ministry’s proposal.”

Section 3, Article 13, sub-title (c)



Current Situation (A) Uniform Tariff (Same Retail Sale Price at each Distribution Region)





Current Situation (B) Uniform Tariff

DISCOUNTED TARIFF APPLIED;

- To ETİ Krom A.Ş., ETİ Elektrometalurji A.Ş. ve Eti Alüminyum A.Ş., state economic enterprise in mining sector, as %40 below the monthly average selling price of the related consumer group.
- To investments and businesses, for those which has the certification for tourism incentives, as regional lowest tariff that implemented residential and industrial
- To induction and arc furnaces, under the condition of implementing necessary metering system, as night tariff (valley rate) for energy consumed at Saturdays and Sundays.
- To families of martyrs and veterans, as %60 of residential tariff.
- To customer groups, namely industrial, drinking and usage water, treatment facilities, residential and general lightning, which located at underdeveloped provinces, as %7 lower than other provinces.



An International Example for Transition Countries

COUNTRY	Armenia	Bulgaria	Hungary	Krygz	Lithunia	Moldovia	Romania	Ukraine
1) TYPE of PROGRAM								
a) Tariff Based								
i) Discounted tariff for low income customers				X		X	X	X
ii) Basic need tariff for all customer classes							X	
iii) Cross-subsidy among customer classes	X	X	X	X		X		X
b) Direct cash transfer	X	X	X	X		X	X	X
c) Minimum service programs								
i) Continuity of service in any case								
ii) Subsidy for electricity consumption		X					X	X
2) ROLE of REGULATORY AGENCY								
a) Program design				X			X	
b) Application of program				X			X	
c) Program monitoring	X	X		X			X	X
3) FINANCIAL SOURCE of PROGRAM								
a) Service Provider	X		X	X				X
b) Government		X		X	X		X	X
c) Other customers in same group	X			X			X	
d) cross subsidy among customer classes	X	X		X				X

Source: Tariff/Pricing Committee Issue Paper No:2 "Low-Income Customers-Meeting Their Needs" – Fourth Annual energy Regulatory Conference, Central/Eastern Europe & Eurasia- December 11-13, 2000 Bucharest, Romania



An International Example for Developed Countries

COUNTRY	AUS	ESP	FIN	IRL	ITA	NL	NOR	POR	UK
Regulated Prices for captive customers		X		X	X	X		X	
Social tariffs for low income customers				X	X			X	X
National equalization mechanism									
(network access tariffs)		X		X	X			X	X
National equalization mechanism									
(end user tariffs)		X			X			X	



*Thank You Very Much for
Your Attention*



Relation Between Growth & Electricity Consumption

$$\Delta \text{consumptionlog} = 0,0564 + 0,688 \Delta \text{gdplog} - 0,252 \varepsilon(t-1) ,$$

*R*² = 0,71 (11,552) (8,015) (-4,867)

Even if relation between gross electric consumption and gross domestic product exhibits instability in the short run, equilibrium error term $\varepsilon(t-1)$ can be used to transform short run relation to long run relation between these two variables. The coefficient β_2 (0,252), in the model – whose negative sign compromises with theoretical expectations - shows that each year 25% of difference between observed value of gross electricity consumption and long run equilibrium will disappear.



Growth Rates

