

**Baskent
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Toroslar**

Regulation and Tariff in Turkish Electric Utilities

March 2018

Q&A

- Regülasyon nedir?
- Doğal tekel nedir? Örnekler nelerdir?
- Türkiye elektrik piyasası nasıl işler? Sistemin işleyişi nasıldır? Oyuncuları kimlerdir rolleri nelerdir?
- Tarife nedir? Bileşenleri nelerdir?
- Dağıtım sektörünün regülasyonunda Türkiye’de benimsenen yöntem nedir?
- Perakende sektörünün regülasyonunda Türkiye’de uygulanan yaklaşım nedir?
- Türkiye’de dağıtım sektörünün düzenlenmesinde uygulama dönemleri nelerdir?
- En son uygulama dönemindeki genel regülasyon yöntemi ve ayrıntıları nelerdir?
- Dağıtım şirketleri nerelerden gelir elde ederler? Geliri oluşturan bileşenlerin en önemlileri hangileridir?
- Türkiye’de kaç dağıtım şirketi vardır, hangi gruplara aittir?

Macroeconomic Approach

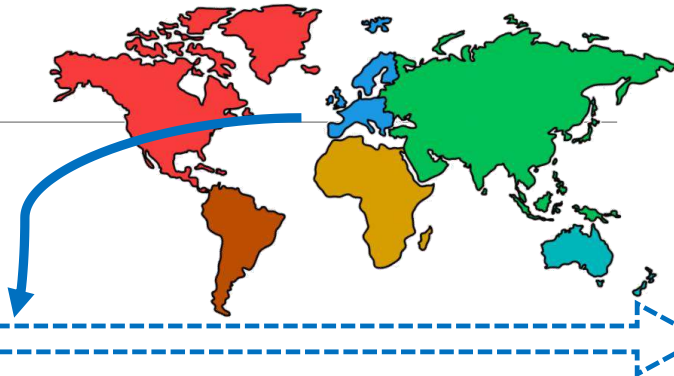
Market Structure

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Revenue Requirement Parameters

Brief History of Political Economics



Adam Smith (1723-1790)	Jean Baptiste Say (1767-1832) David Ricardo (1772-1823)	Karl Marx (1818-1883)	John Maynard Keynes (1883-1946)	Neo-Liberalism (From 1970s) Kuznets, Hayek, Friedman
<ul style="list-style-type: none"> • Zero Sum Game • The Wealth of Nations: Liberalism of Contracts and Trade • Abolishing regulations • Invisible Hand in markets 	<ul style="list-style-type: none"> • Supply creates its own demand • Marginal labor yield and decreasing yield law • Labor price: supply & demand and employment balance 	<ul style="list-style-type: none"> • Industrial Capitalism • Theory of Capital Accumulation 	<ul style="list-style-type: none"> • 1929 Great Depression • Not every supply creates its own demand • Intervention role of Government • Money and Finance policies 	<ul style="list-style-type: none"> • Inequality (Bell-Shaped) • Friedman: Main role of Government: Control of money supply • Natural Monopoly • «Homo Economicus» • Maurizio Lazzarato: Financial Capitalism and manage by debt

Regulation History

Anglo-Saxon World and Chile

Chile

1978

- Reforms by National Energy Commission in Chile after coup of Pinochet

Chile

1982

- «1982 Electricity Operation» in Chile
- Neo-liberal politics by **Milton Friedman**, Al Harberger and other economists in Chicago School are reviewed
 - Government role: Control of money supply,
 - Government presence: Natural Monopoly
 - Special Monopoly, Public Monopoly, Regulation
- First examples of:
 - Market prices are determined by Independent Power Producers (IPPs)
 - Electricity sales to customer by bilateral contracts
 - Eligible customer definition and their rights
 - Incentive based mechanisms applied in distribution sector



Great Britain

1989

- «White Book» consisting suggestions by parliament about privatizations became Energy Law
- First examples of:
 - Transmission, Distribution and Sales were separated
 - Spot market for electricity prices was launched
 - Competition started among sales companies
 - Transmission and distribution monopolies were privatized and regulated



Regulation History Continental Europe

From 1990s

- Electricity and NG markets were monopolized, EU and Member States opened them to competition:
 - Distinguishing clearly between competitive parts of the industry
 - Free up the supply side of the market
 - Remove gradually any restrictions on customers from changing their supplier (reason for liberalization)
 - Introduce independent regulators to monitor the sector
- **First** liberalization directives were adopted in 1996 for electricity market
- EU Commission **benchmarking** reports on the implementation of internal electricity market
- **Second** liberalization directives were adopted in 2003 and were to be transposed into national law by Member States by 2004
 - Full market opening timetable
 - Legal unbundling of networks
 - Regulated Access to networks with published tariff and methodology approved in advance
- **Sector Inquiry** is made, to identify the barriers preventing more competition in these markets. The results were published in 2007.
- **Third** liberalization directives were adopted in 2003 to strengthen competition in electricity market.

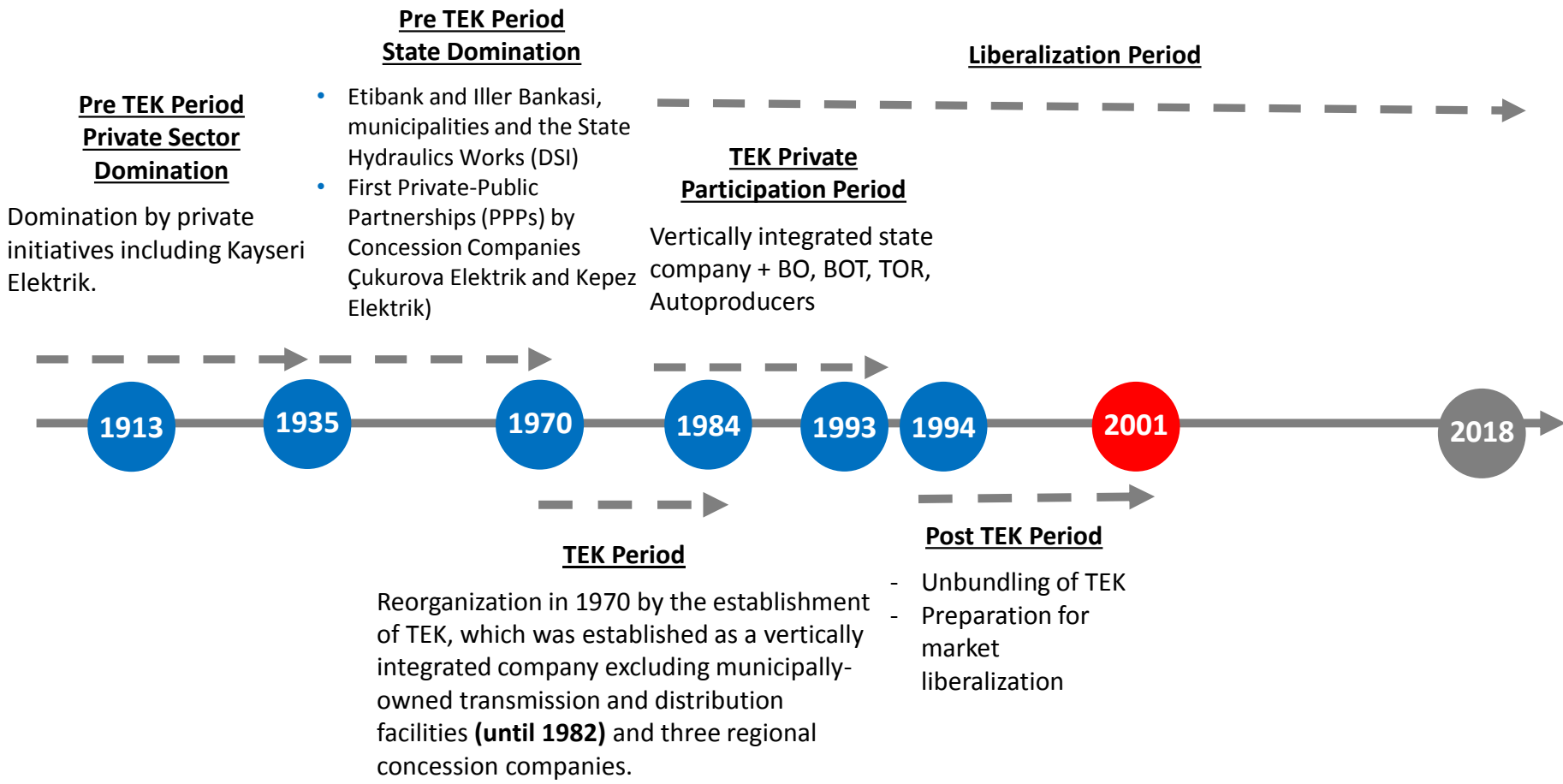


Regulator

- New institution
- Committed to liberalization
- Free from need and bargain
- Independent from regulated companies, finance and governmental bodies
- Accountable (annual reports, public and parliament hearings)

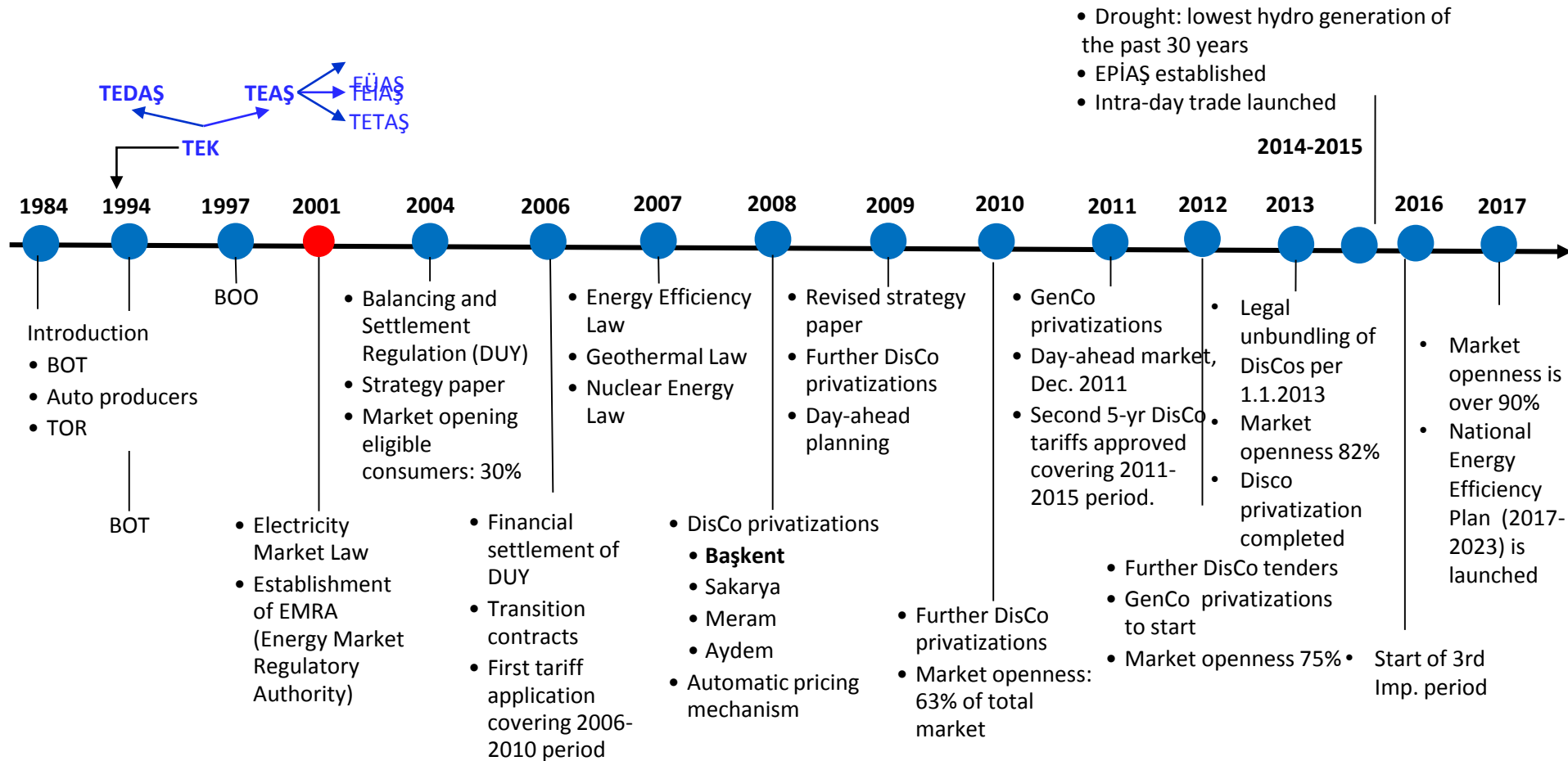
How market evolved?

Before liberalization



How market evolved?

Ongoing liberalization



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Distribution Regions at a Glance



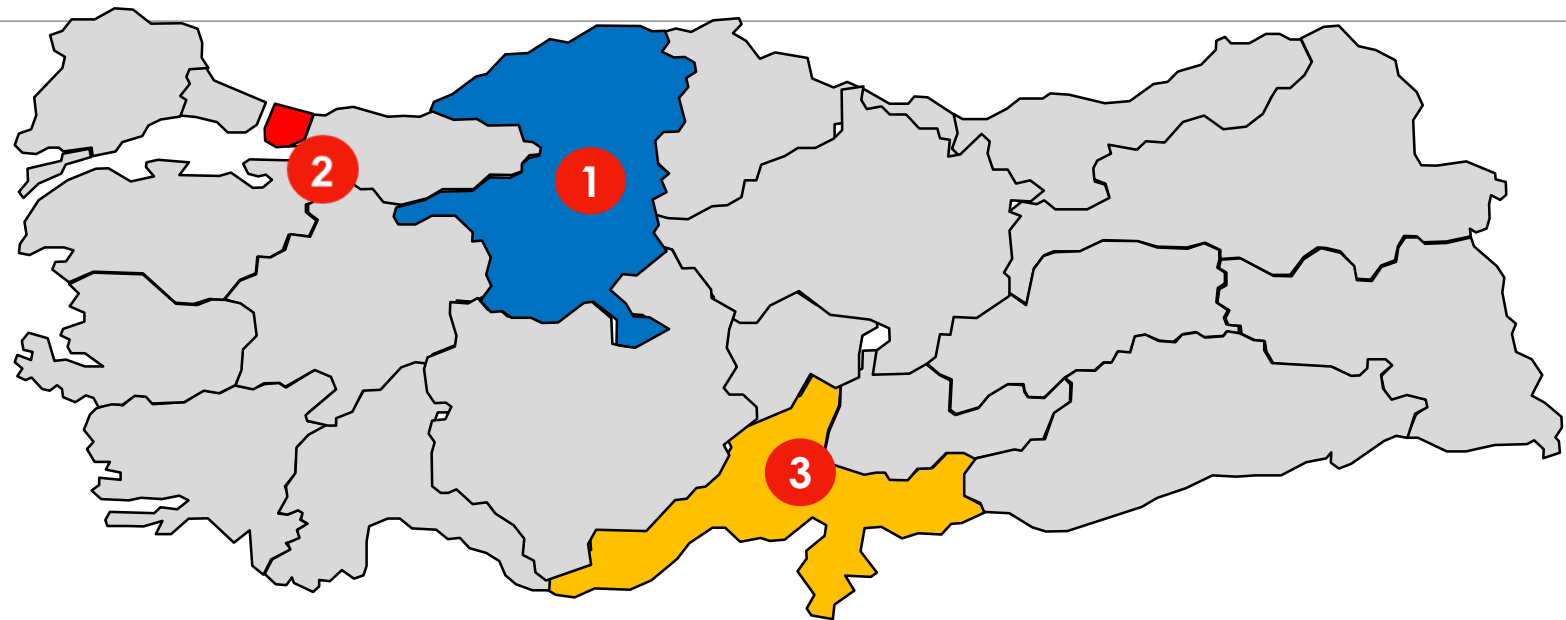
Distribution Regions



Trakya	Gediz	Akdeniz	Kayseri ve Cıvırı	Fırat	Çoruh
Boğaziçi	Sakarya	Meram	Çamlıbel	Göksu	Aras
İst. Anadolu Yakası	Osmangazi	Yeşilirmak	Toroslar		Vangözü
Uludağ	Menderes	Başkent			Dicle

Enerjisa Electricity Distribution

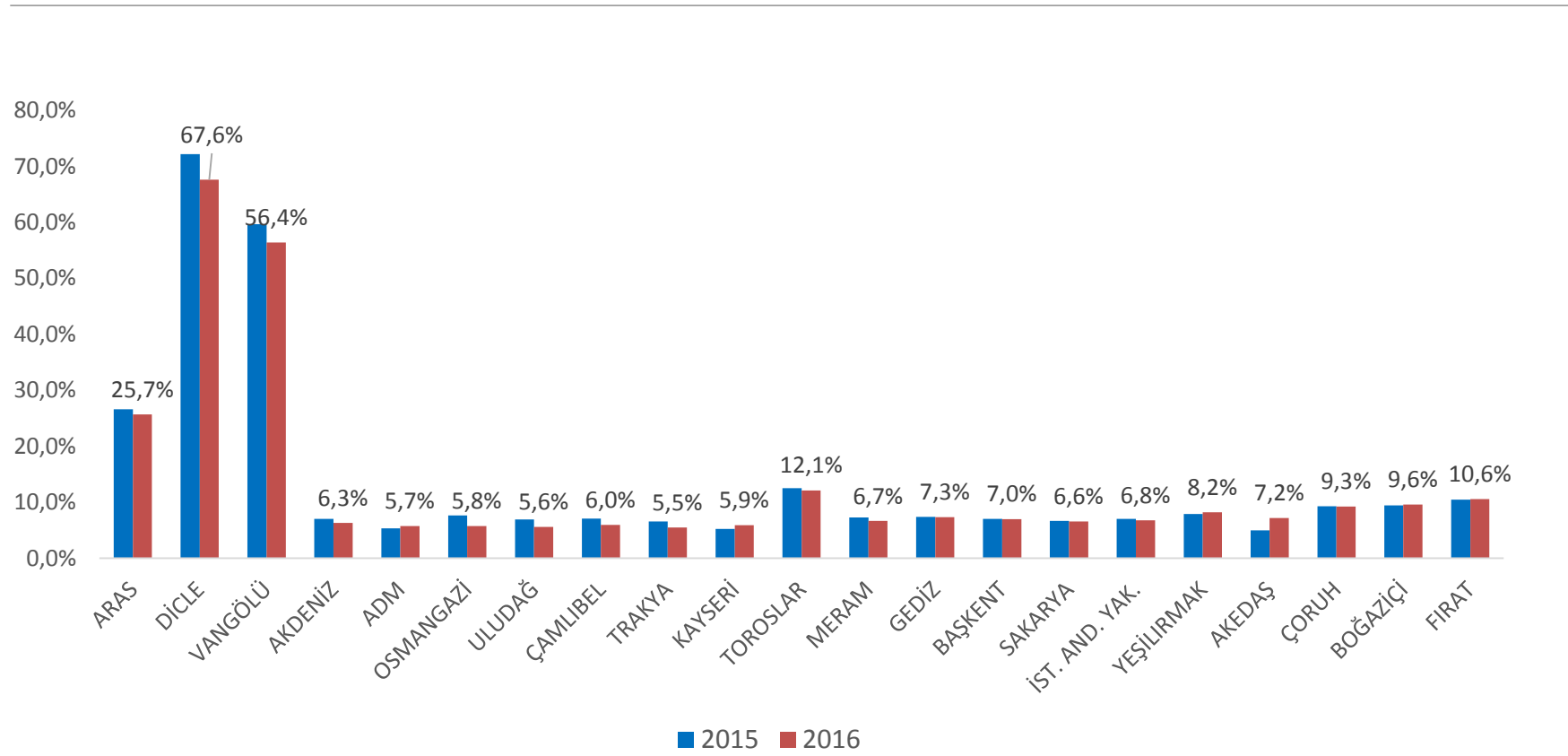
Serving to 10,5 million customers on 110 thousand km²



		Grid length [1,000 km]	Grid customers [millions]	Distributed volume [TWh]	# of Counties
1	BAŞKENT	107.1	4.1	15.9	7
2	AYEDAŞ	22.7	2.7	12.3	1
3	TOROSLAR	84.1	3.7	17.2	6
	ENERJISA	213.9	10.5	45.4	14

Figures illustrate 2016

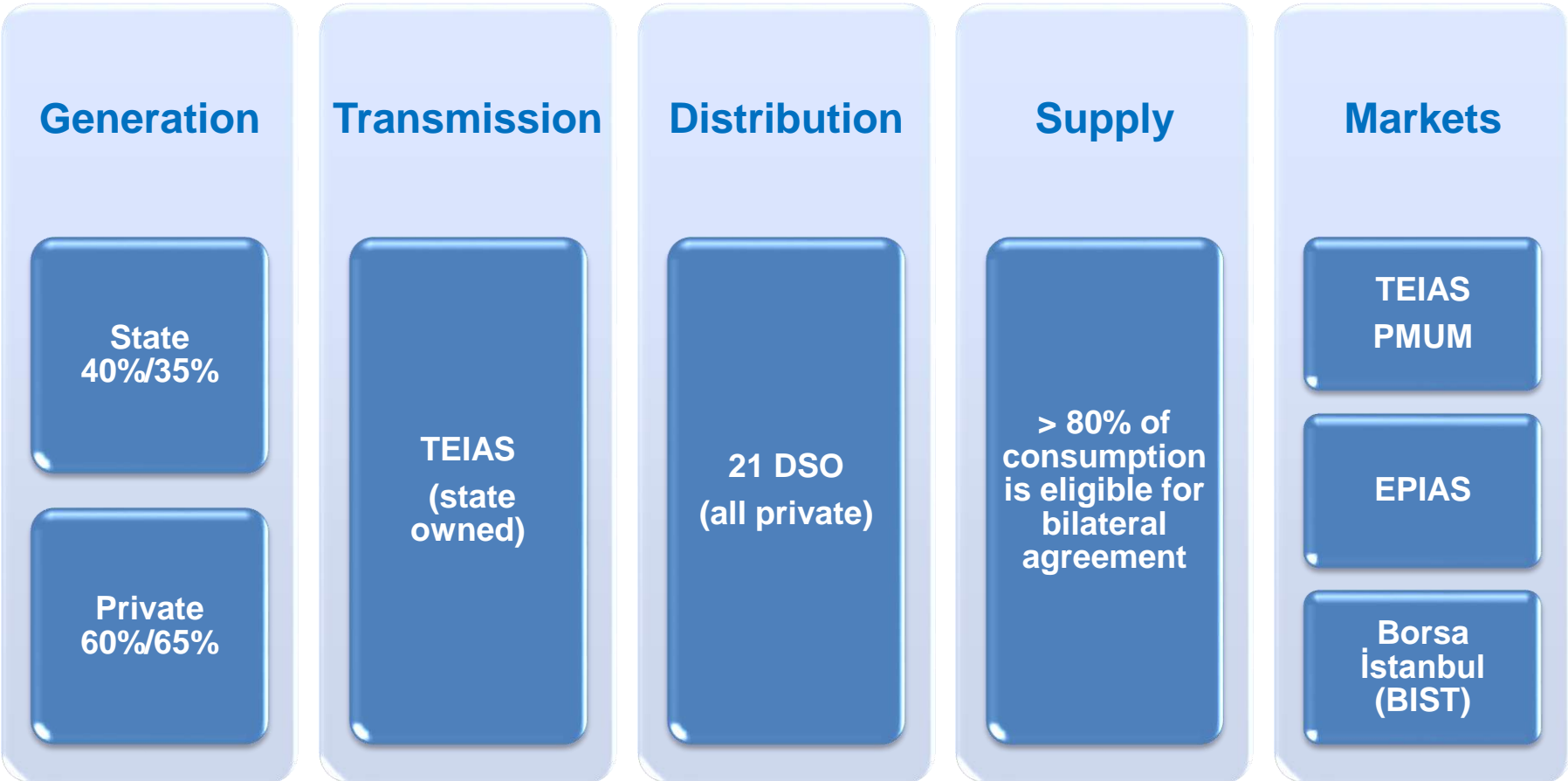
Theft and Loss Rates by Region



High T&L rates compared to European countries especially in 3 regions: Main obstacle before regional distribution tariffs

Source: Energy Market Regulatory Authority (EMRA)

Market Structure



Note: TEIAS: State-owned transmission company, PMUM: Electricity Markets Financial Settlement Center, EPIAŞ: Newly established market operation company, BIST: Istanbul Stock Exchange;



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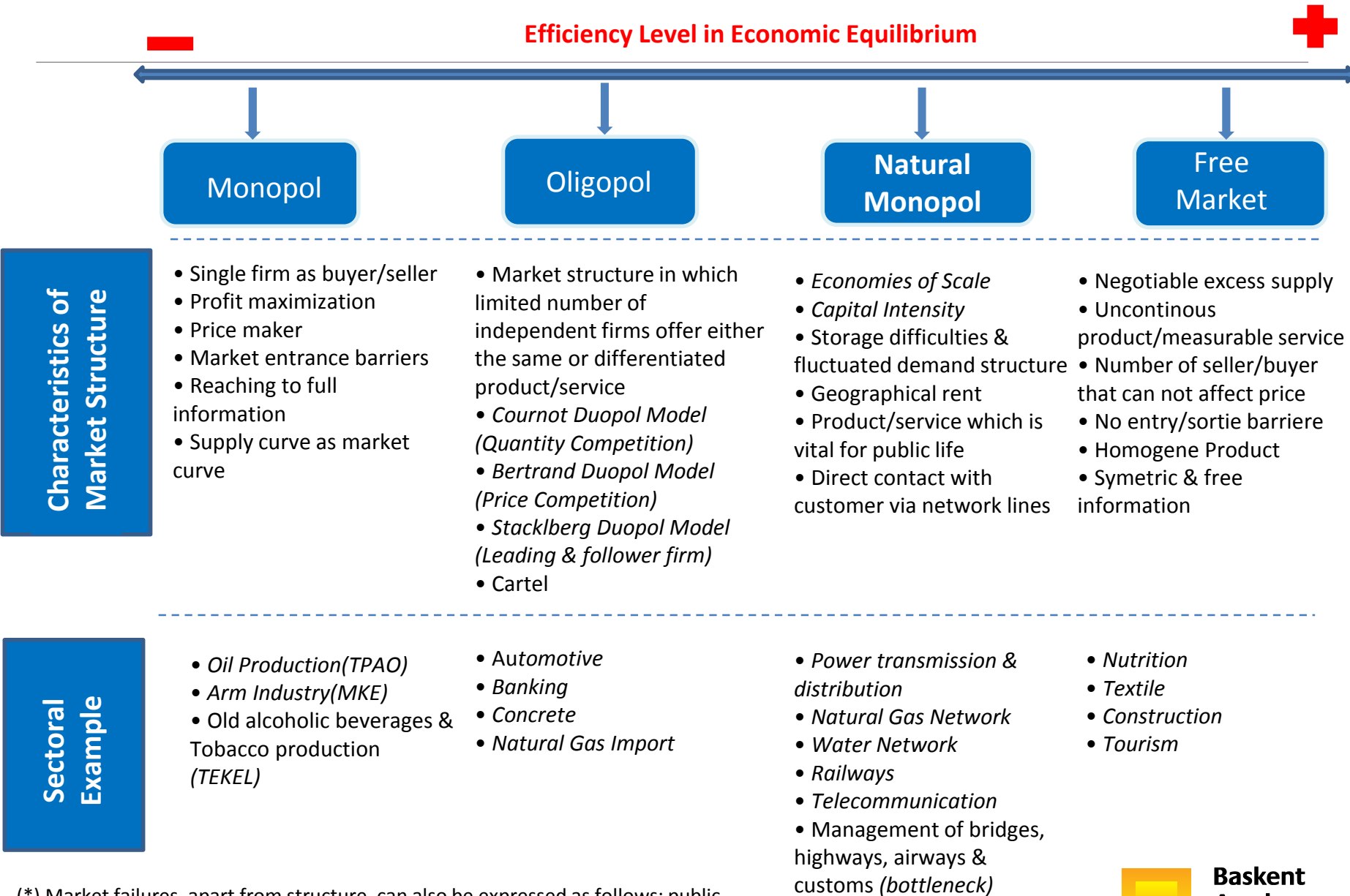
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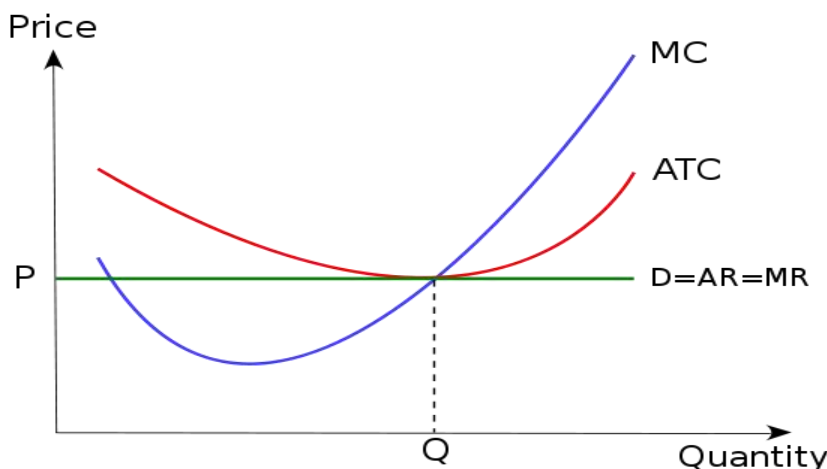
What kind of market are we talking about?



(*) Market failures, apart from structure, can also be expressed as follows; public goods, externalities, assymetric information, natural monopolies.

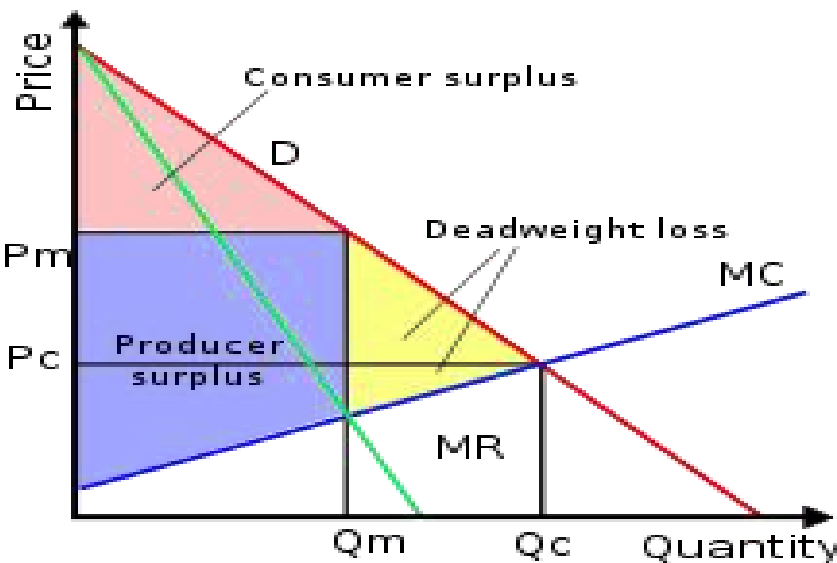
A little bit of economics

Perfect Competition

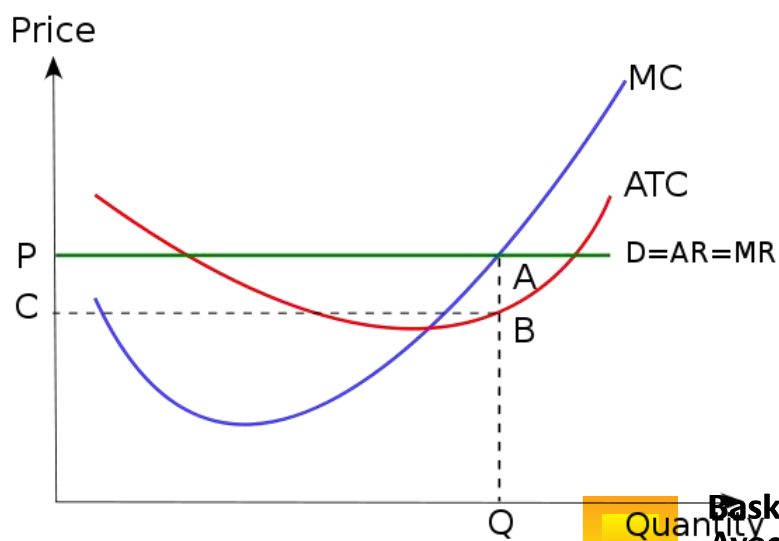


- Homogenous products: Same quality and characteristics
- A large number buyers and sellers
- No barriers of entry and exit
- Perfect factor mobility: Capital, employee, land, enterprise
- Perfect information: Price, utility, quality and production methods.
- Zero transaction costs: No trading opportunity

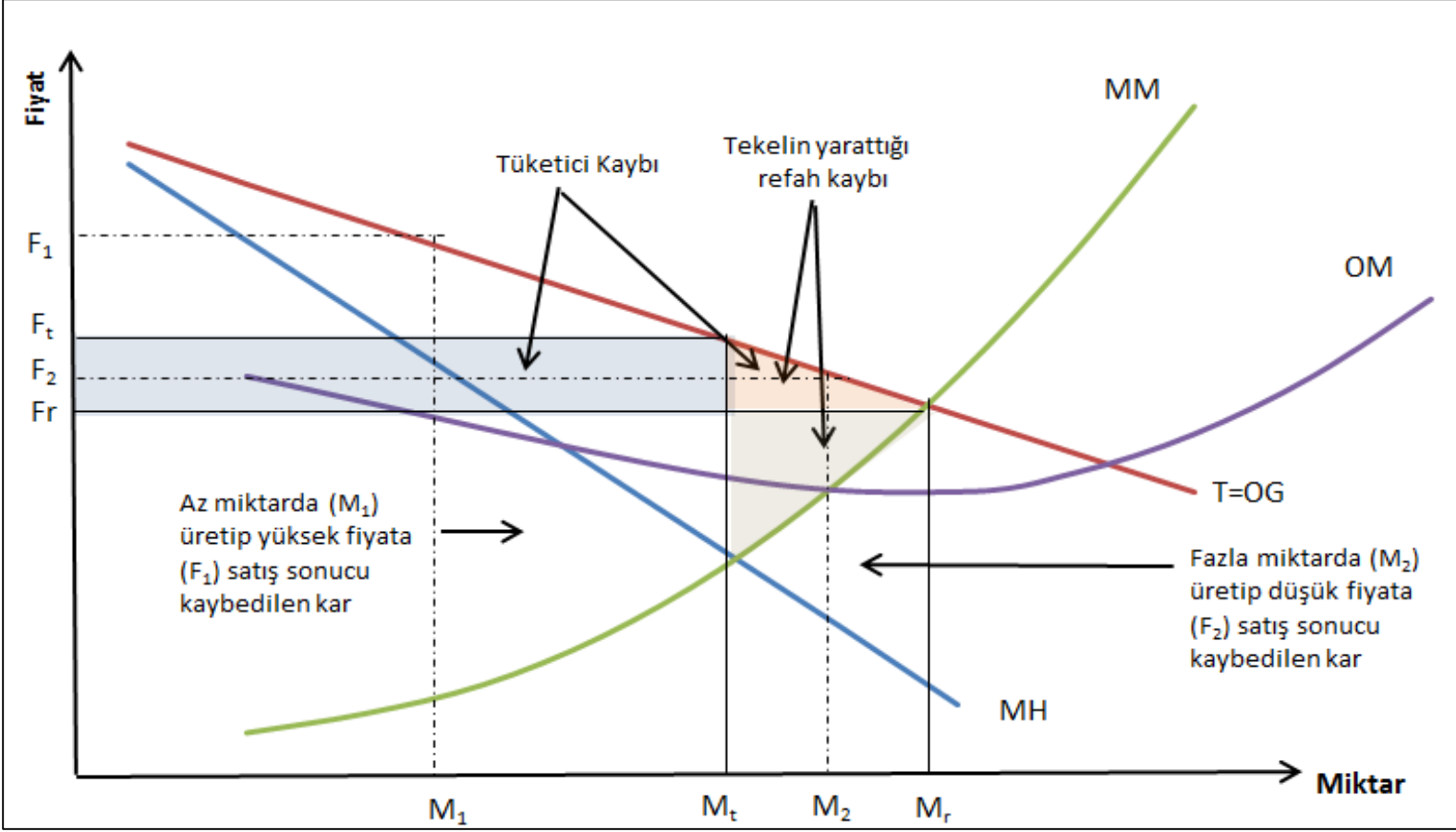
Monopol



Real World



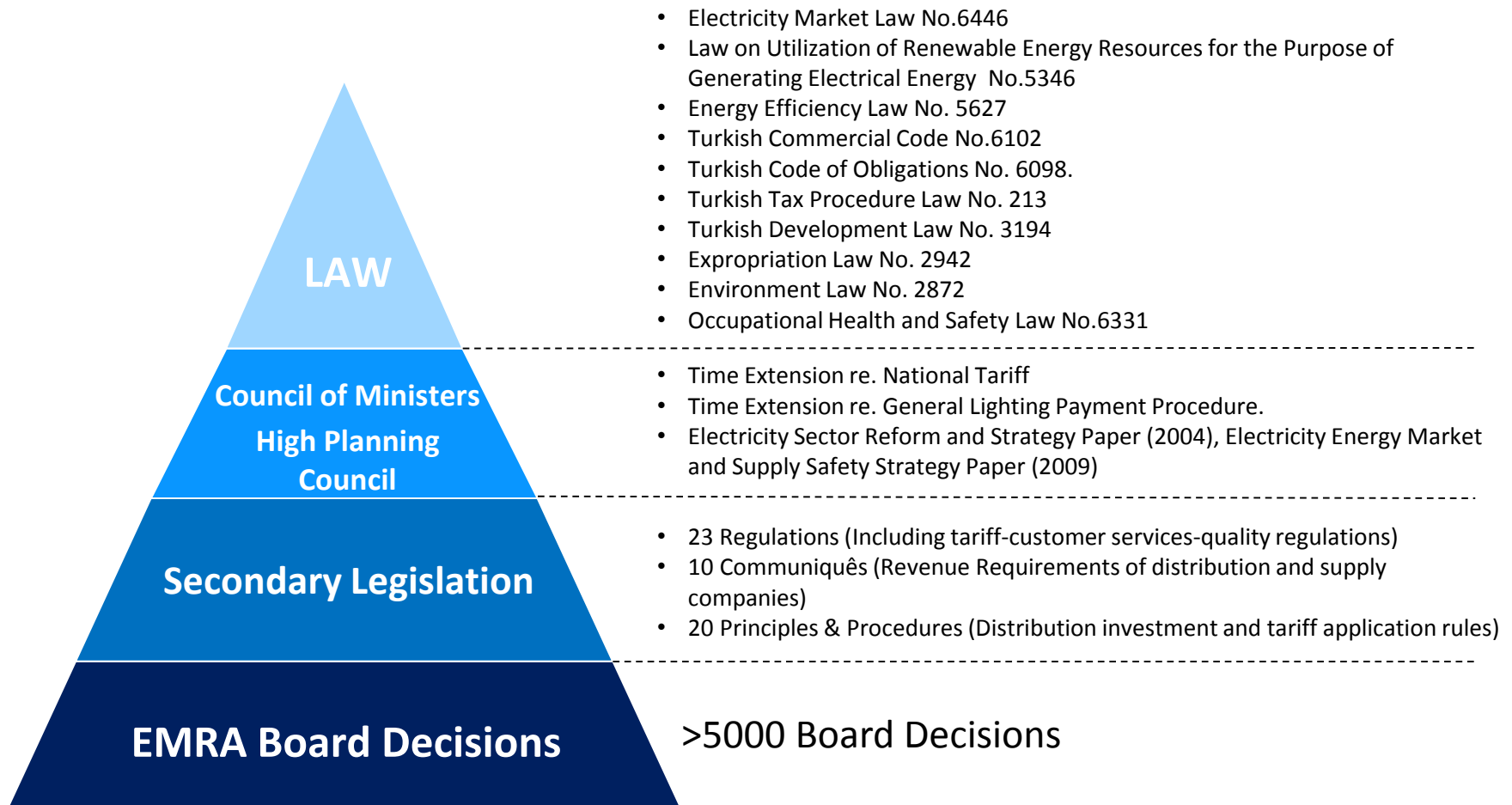
Natural Monopoly & Loss of Social Welfare



MM: Marjinal Maliyet **OM:** Ortalama Maliyet **OG:** Ortalama Gelir **MH:** Marjinal Hasılat

Current Legal Framework

The legislation



Tariff & End - User Price Structure

1.1.2018		Faaliyet Bazlı Tüketici Tarifeleri (kr/kWh)				
İletim Sistemi Kullanıcıları	Görevli Tedarik Şirketinden Enerji Alan İletim Sistemi Kullanıcısı Tüketiciler	Perakende Tek Zamanlı Enerji Bedeli	Perakende Gündüz Enerji Bedeli	Perakende Puant Enerji Bedeli	Perakende Gece Enerji Bedeli	Dağıtım Bedeli
	Tüketici	21,9735	21,8309	38,8700	9,5407	0,0000
Dağıtım Sistemi Kullanıcıları	Dağıtım Sistemi Kullanıcıları	Perakende Tek Zamanlı Enerji Bedeli	Perakende Gündüz Enerji Bedeli	Perakende Puant Enerji Bedeli	Perakende Gece Enerji Bedeli	Dağıtım Bedeli
	Orta Gerilim					
	Çift Terimli					
	Sanayi	21,9735	21,8309	38,8700	9,5407	5,7097
	Ticarethane	23,0995	22,9514	41,0469	9,8783	9,1365
	Mesken	23,0927	22,9446	41,0400	9,8718	8,9161
	Tarımsal Sulama	21,1108	20,9753	37,5335	9,0140	7,4938
	Aydınlatma	21,1182				8,7751
	Tek Terimli					
	Sanayi	21,9735	21,8309	38,8700	9,5407	6,3355
	Ticarethane	23,0995	22,9514	41,0469	9,8783	11,3104
	Mesken	23,0927	22,9446	41,0400	9,8718	11,0375
	Tarımsal Sulama	21,1108	20,9753	37,5335	9,0140	9,2768
	Aydınlatma	21,1182				10,8629
	Alçak Gerilim					
	Tek Terimli					
	Sanayi	21,9735	21,8309	38,8700	9,5407	9,6625
Ticarethane	23,0995	22,9514	41,0469	9,8783	13,3577	
Mesken	23,0927	22,9446	41,0400	9,8718	13,0444	
Şehit Aileleri ve Muharip Malul Gaziler	8,4718				8,8939	
Tarımsal Sulama	21,1108	20,9753	37,5335	9,0140	10,9561	
Aydınlatma	21,1182				12,8028	
Genel Aydınlatma	21,1182				12,8028	

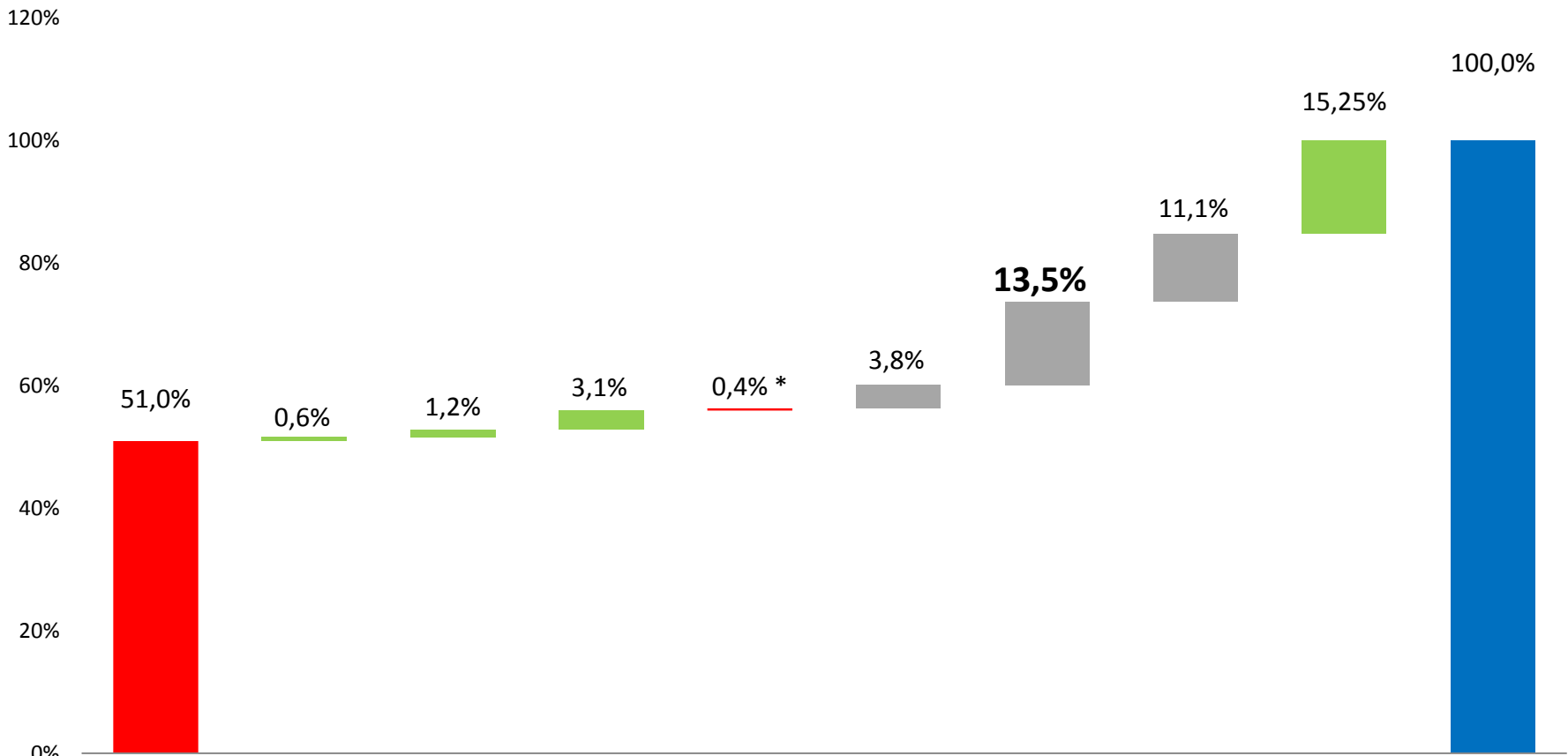
Household Share in Bill

Residential Unit Energy Price	23,09	50,98%
Distribution Fee	13,04	28,80%
Energy Fund	0,28	1,00%
TRT Share	0,56	2,00%
Municipality Share	1,40	5,00%
VAT (18%)	6,91	18,00%
End User	45,29	100,00%

- There are (6) main subscriber group (industrial, household, commerce, agricultural irrigation, casualty family, lighting)
- MV – LV, single – double term, single - multi time discrimination in tariffs.
- «National Tariff» is instead of regional tariff.
- Cross Subsidy is present.

2018-Q1 Regulated Price Components

Share of Bill Components for Regulated Households



Funds are calculated as of certain percentage of Energy price and distribution fee

Unified as Distribution Fee

*Energy price & retail service fee are unified

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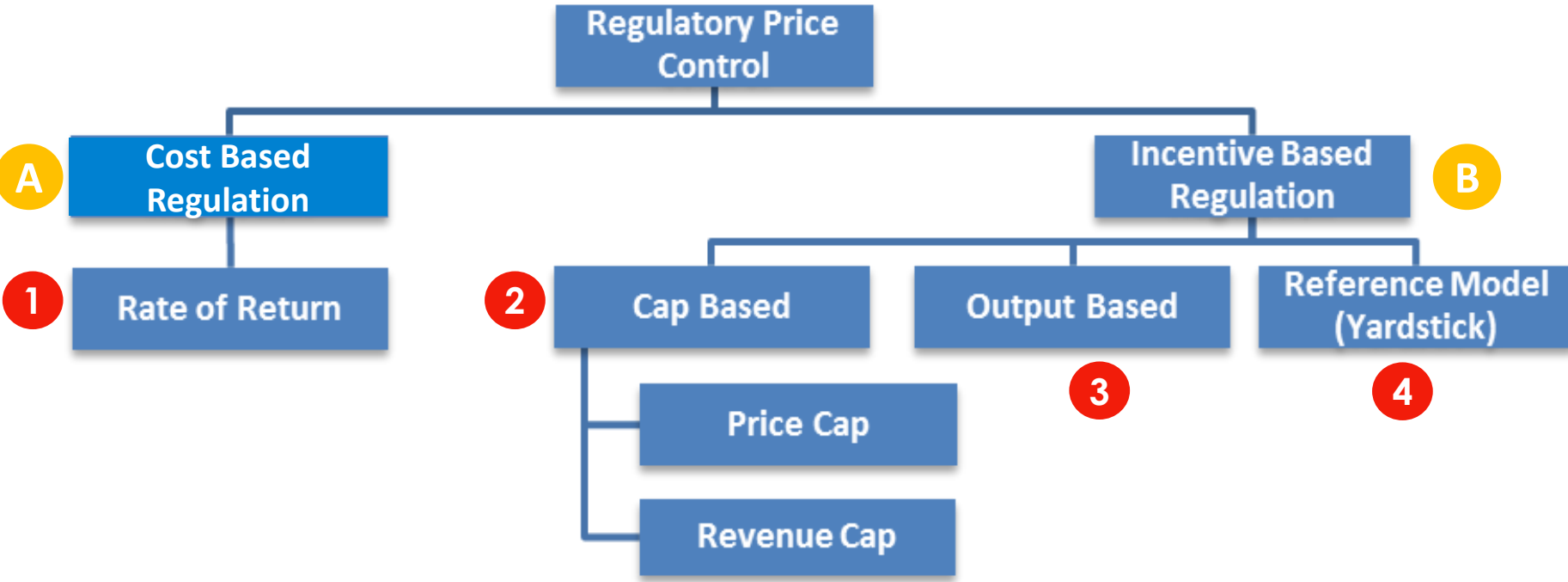
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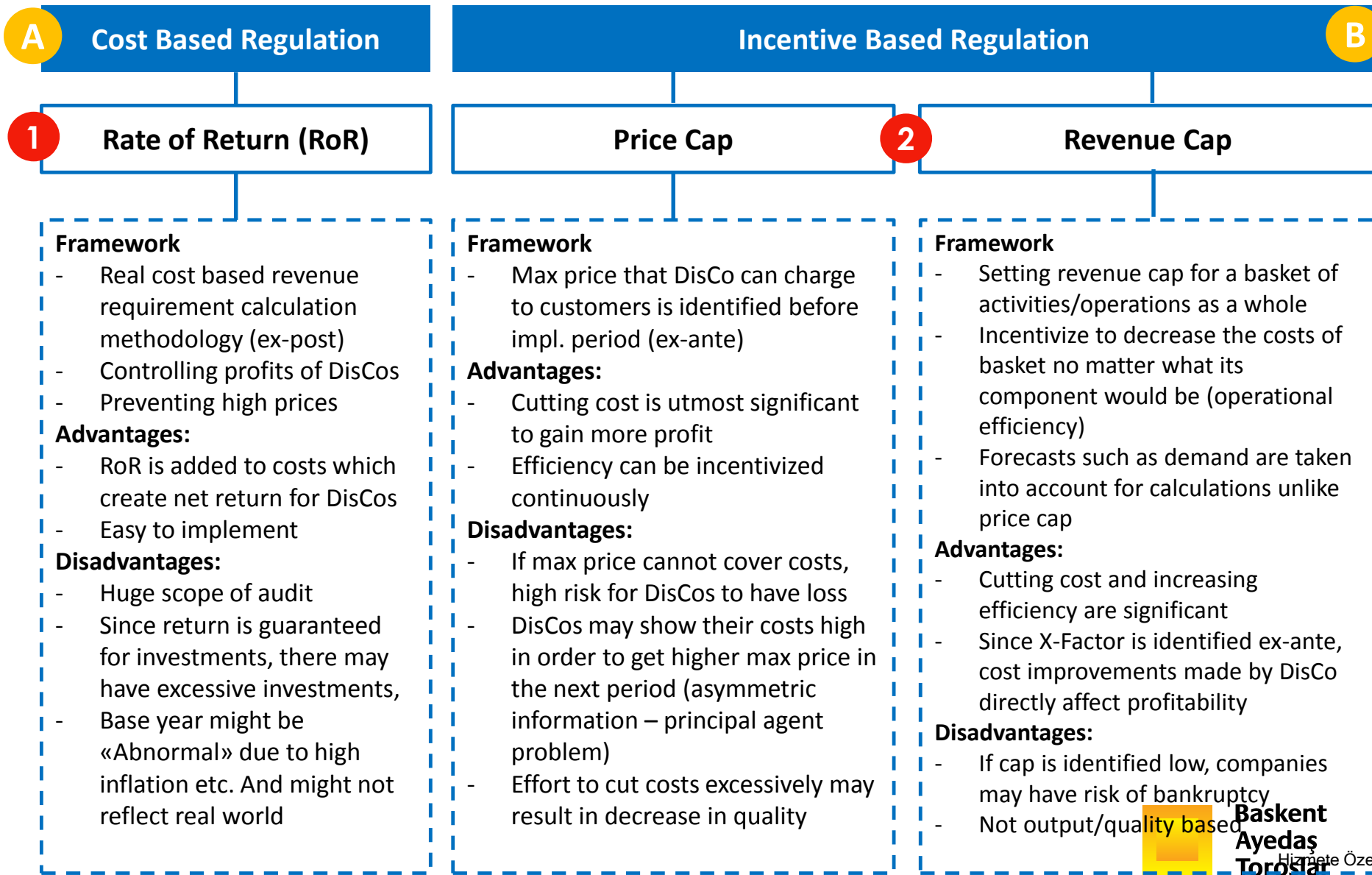
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Revenue Requirement Parameters

Regulation Methodologies



Regulation Methodologies Explanations



A

Cost Based Regulation

1

Rate of Return (RoR)

Framework

- Real cost based revenue requirement calculation methodology (ex-post)
- Controlling profits of DisCos
- Preventing high prices

Advantages:

- RoR is added to costs which create net return for DisCos
- Easy to implement

Disadvantages:

- Huge scope of audit
- Since return is guaranteed for investments, there may have excessive investments,
- Base year might be «Abnormal» due to high inflation etc. And might not reflect real world

Incentive Based Regulation

B

2

Price Cap

Revenue Cap

Framework

- Max price that DisCo can charge to customers is identified before impl. period (ex-ante)

Advantages:

- Cutting cost is utmost significant to gain more profit
- Efficiency can be incentivized continuously

Disadvantages:

- If max price cannot cover costs, high risk for DisCos to have loss
- DisCos may show their costs high in order to get higher max price in the next period (asymmetric information – principal agent problem)
- Effort to cut costs excessively may result in decrease in quality

Framework

- Setting revenue cap for a basket of activities/operations as a whole
- Incentivize to decrease the costs of basket no matter what its component would be (operational efficiency)
- Forecasts such as demand are taken into account for calculations unlike price cap

Advantages:

- Cutting cost and increasing efficiency are significant
- Since X-Factor is identified ex-ante, cost improvements made by DisCo directly affect profitability

Disadvantages:

- If cap is identified low, companies may have risk of bankruptcy
- Not output/quality based

Regulation Methodologies

Explanations Cont'd

B Incentive Based Regulation

3 Output Based

Framework

- Taken outputs into account besides inputs
- Outputs may be supply continuity and service quality

Advantages:

- Direct impact of increasing quality and customer satisfaction
- Prevent inequality between companies

Disadvantages:

- May create extra costs
- May have risk in predictability, if DisCo cannot satisfy output targets, it may not earn money

Applied in UK by OFGEM:

- RIIO: Revenue=Incentives + Innovation + Output
- Incentives that reward/penalize distributors based on actual performance and expenditure outcomes

4 Reference Model (Yardstick)

Framework

- Identifying reference (similar-comparable) company and compare all DisCos with respect to that
- Independent from past data of DisCos, minimum return is guaranteed
- Regional differences and company characteristics are trying to be taken into account

Advantages:

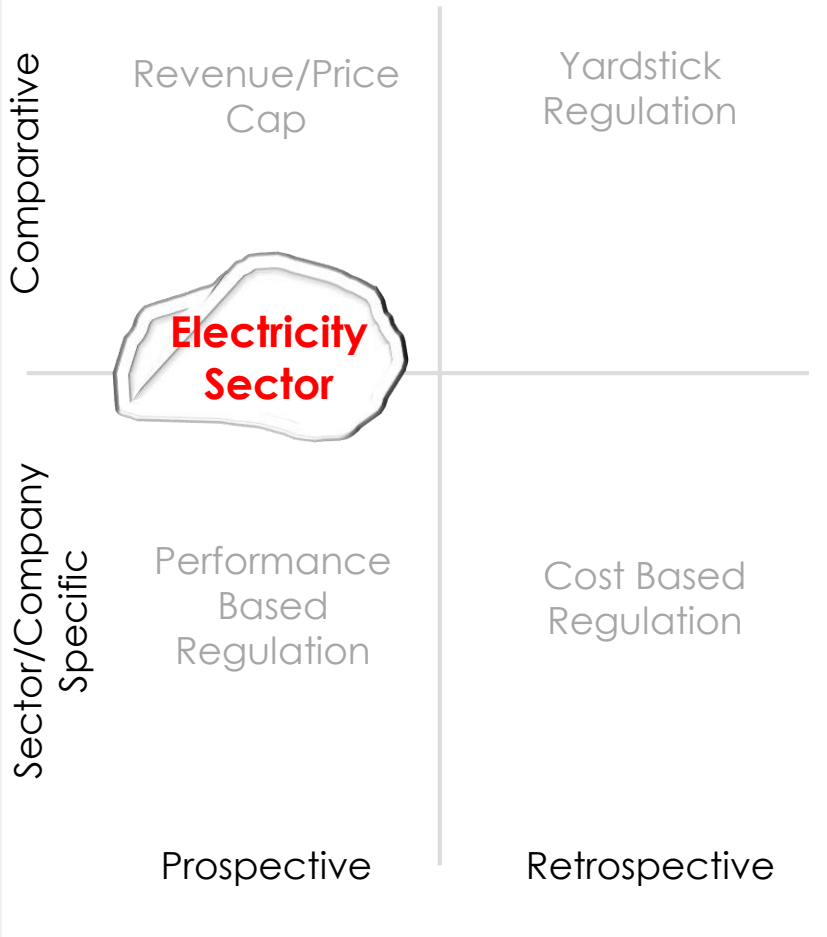
- Social welfare is optimized
- Regulator has access to all data of DisCos thus easy to identify falsified data

Disadvantages:

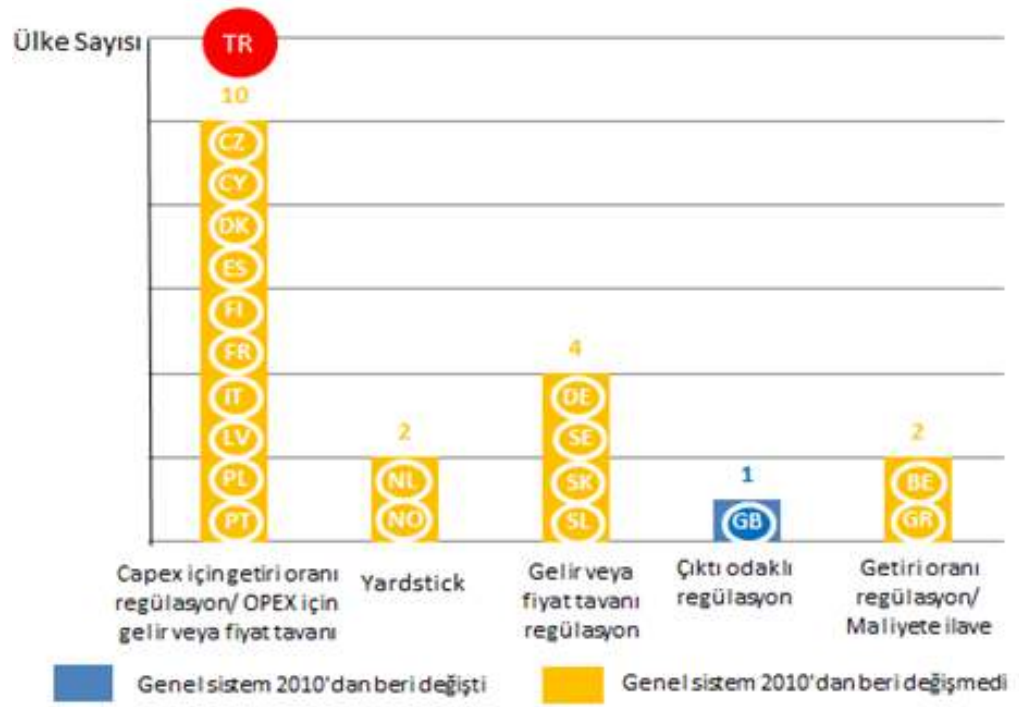
- Regional differences and company characteristics may create inequalities
- Effort to decrease costs may result in decrease in service quality

Evolution of Utility Regulation

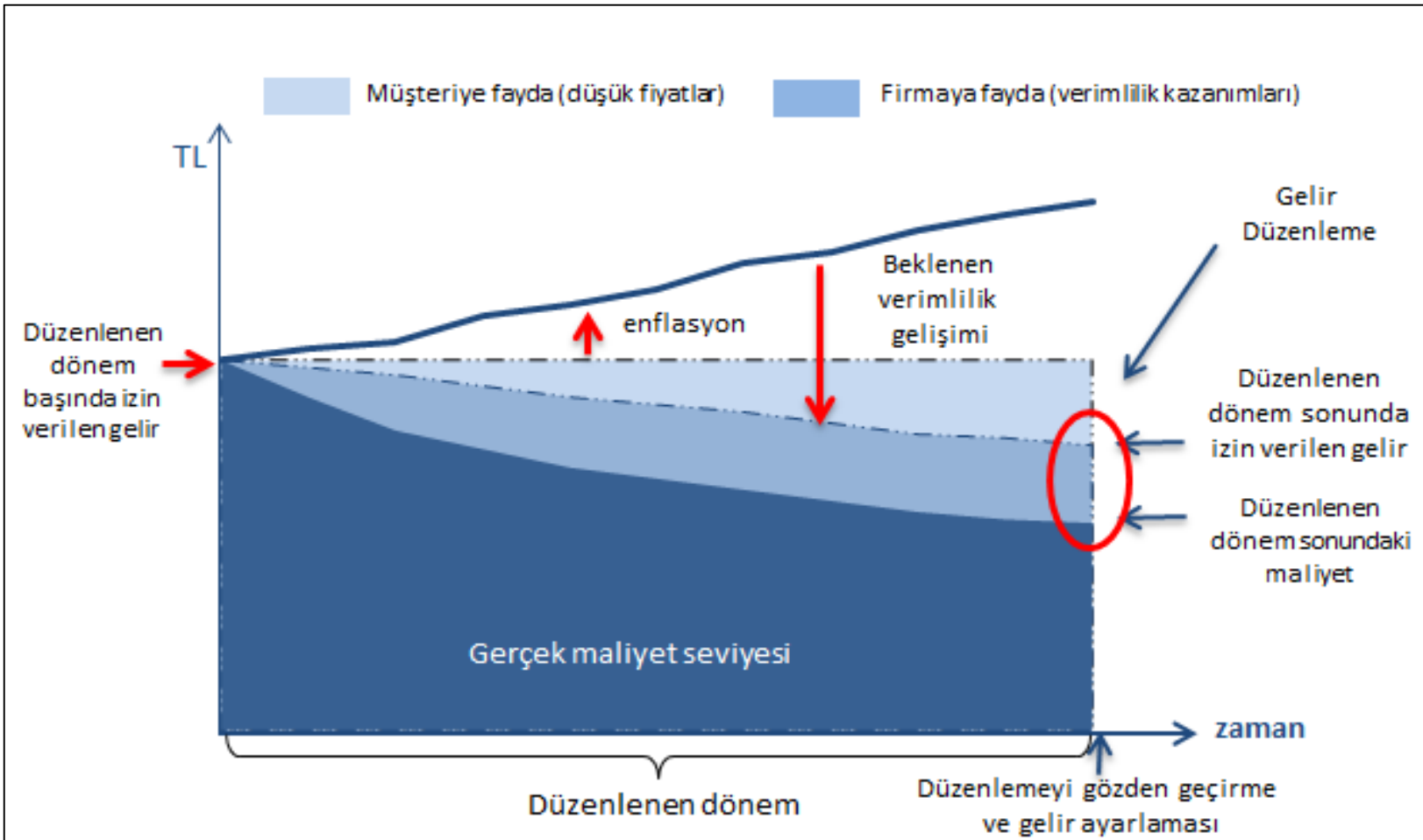
Generic Expression of Methods



Countries



Revenue Requirement Implementation in Turkey



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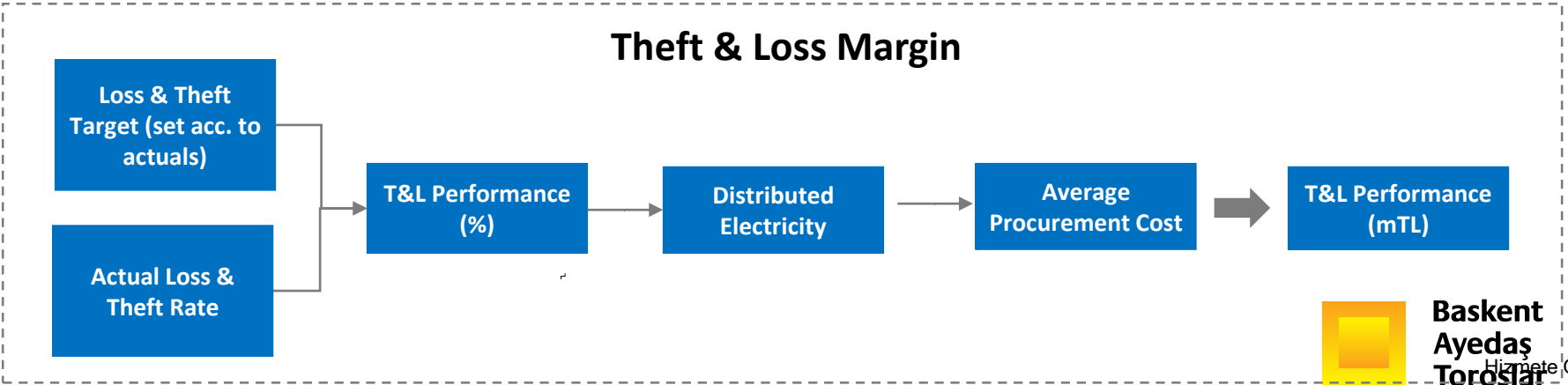
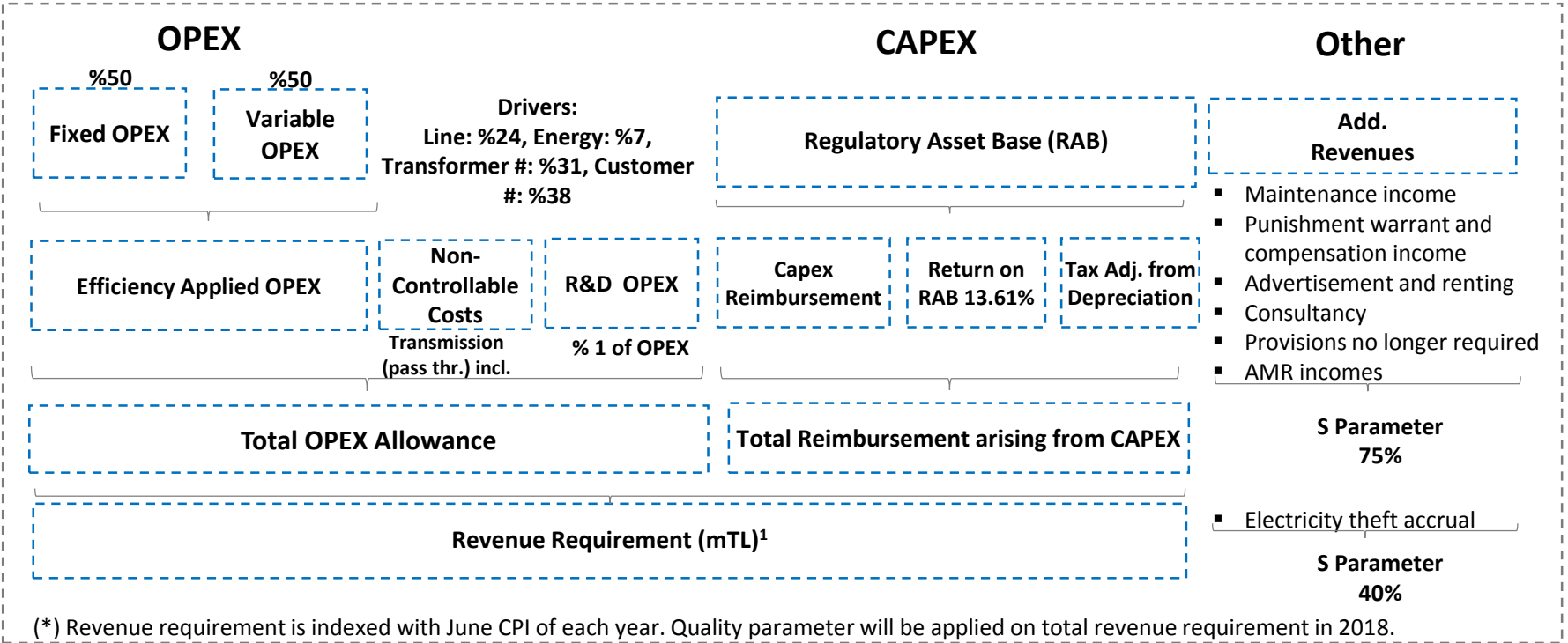
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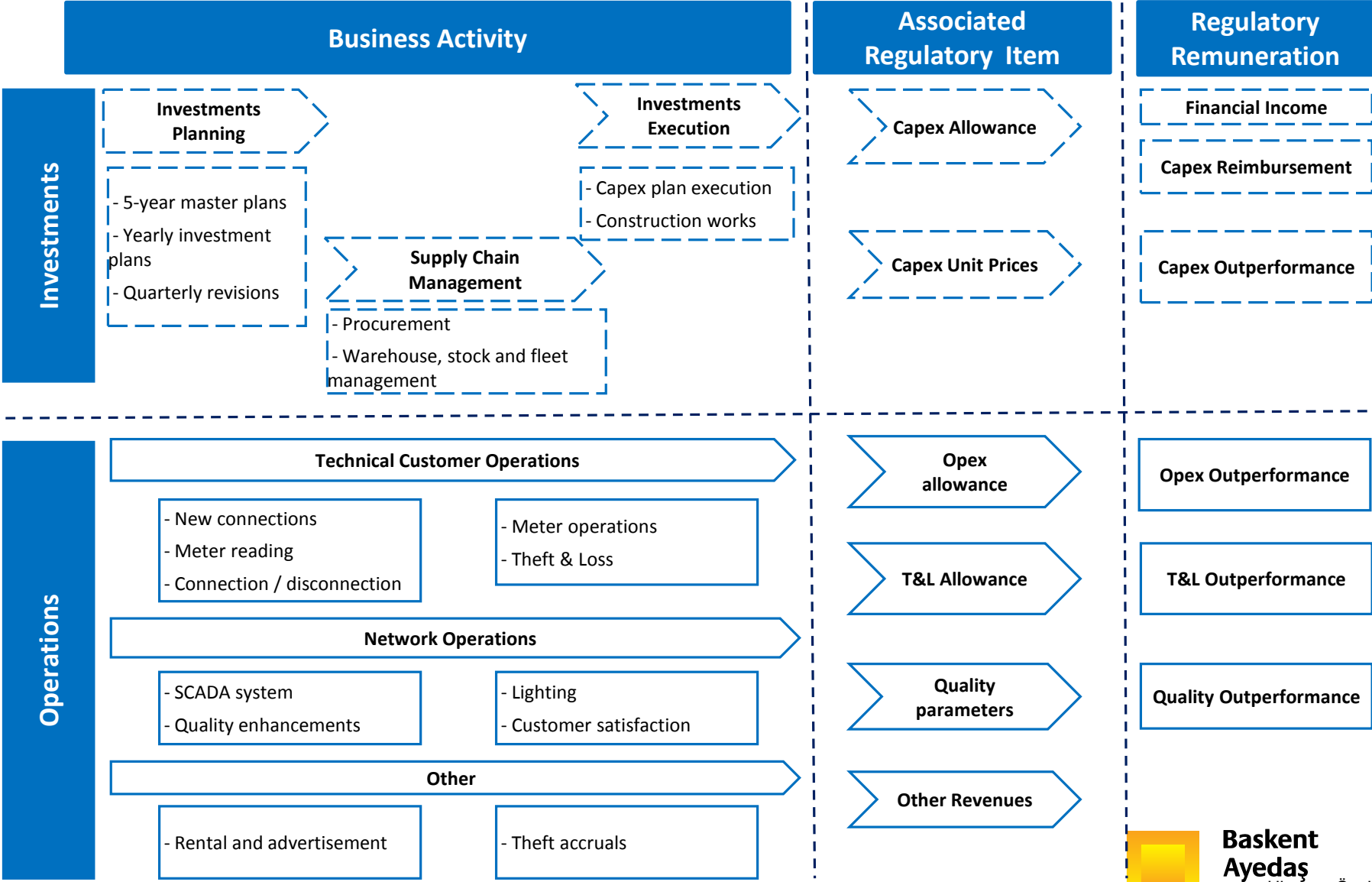
Revenue Requirement Parameters

Overview of Distribution Revenue

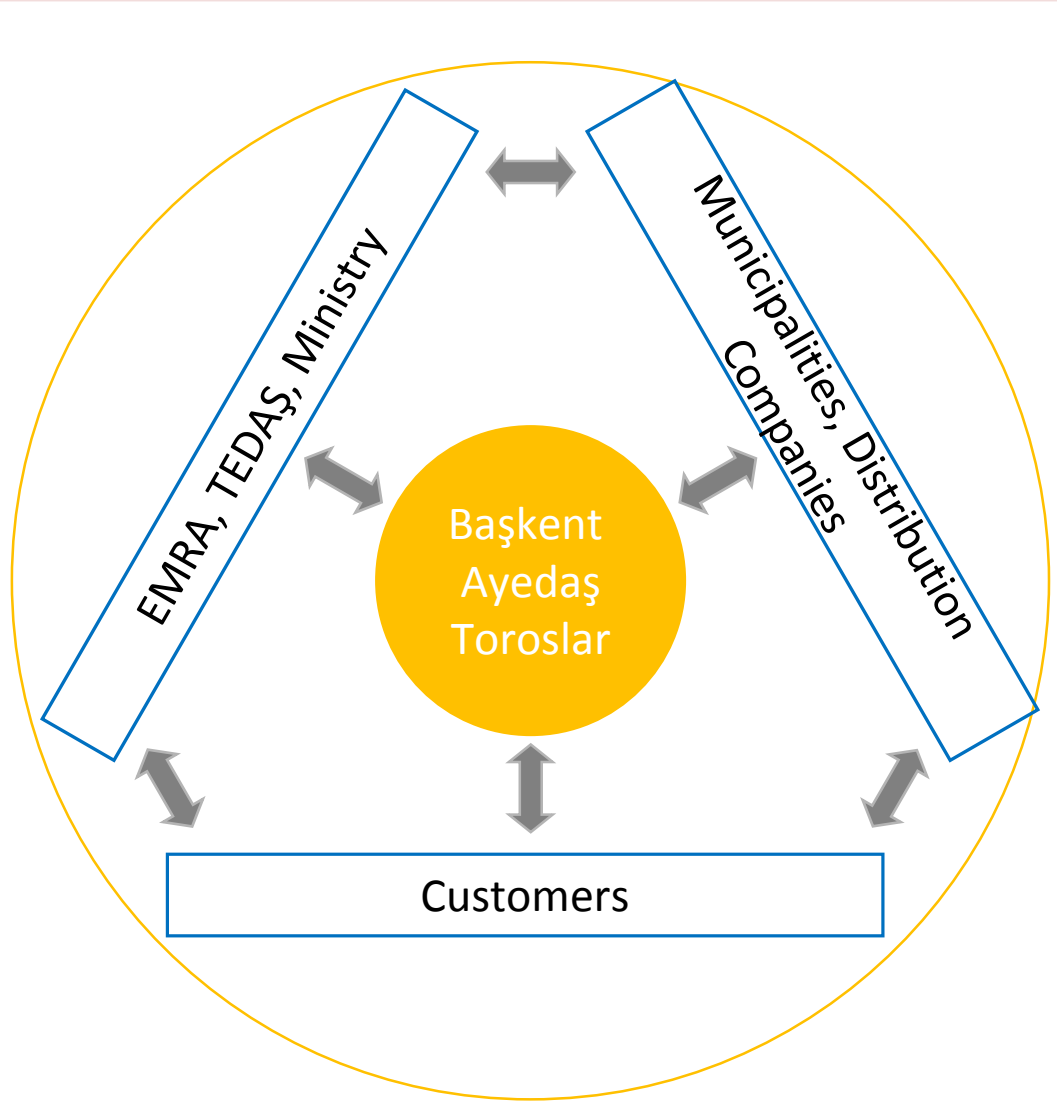
Revenue cap decided upfront in 5-year periods



Scope of the Distribution Business



The sector is simply more than only B2C



Public Side

- Ministry of Energy and Natural Resources (MENR)
- EMRA
- TEDAŞ
- Competition Authority
- Privatization Institution
- Municipalities
- TEİAŞ, TETAŞ
- Other MinUndersecretariat of Treasury
- istries and Public Institutions

Market Side

- Distribution Companies
- Electricity Distribution Services Association (ELDER)
- Organized Industry Parks (OSB)
- Material Suppliers
- Contractors
- Consulting Companies
- Non-Governmental Organizations (NGOs)

Customers

- Distribution Customers
- Free Consumers
- Producers embedded in Distribution
- Unlicensed Electricity Producers
- All customers to whom lighting service is reaching
- VIP Demands



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Thank You...