



**“COAL”**

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## OUTLINE

- Introduction
- Structure of the Coal Sector
- Coal Potential
- Production, Productivity & Consumption
- Coal in Electricity Generation
- Major developments in Coal Sector



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## World Figures

Coal provides **29.6%** of global primary energy needs and generates **42%** of the world's electricity

- **Total Global Hard Coal Production**

  - 6,185Mt (2010e)

  - 5,789Mt (2009)

  - 3,493Mt (1990)

- **Total Global Brown Coal/Lignite Production**

  - 1,042Mt (2010e)

  - 1,033Mt (2009)

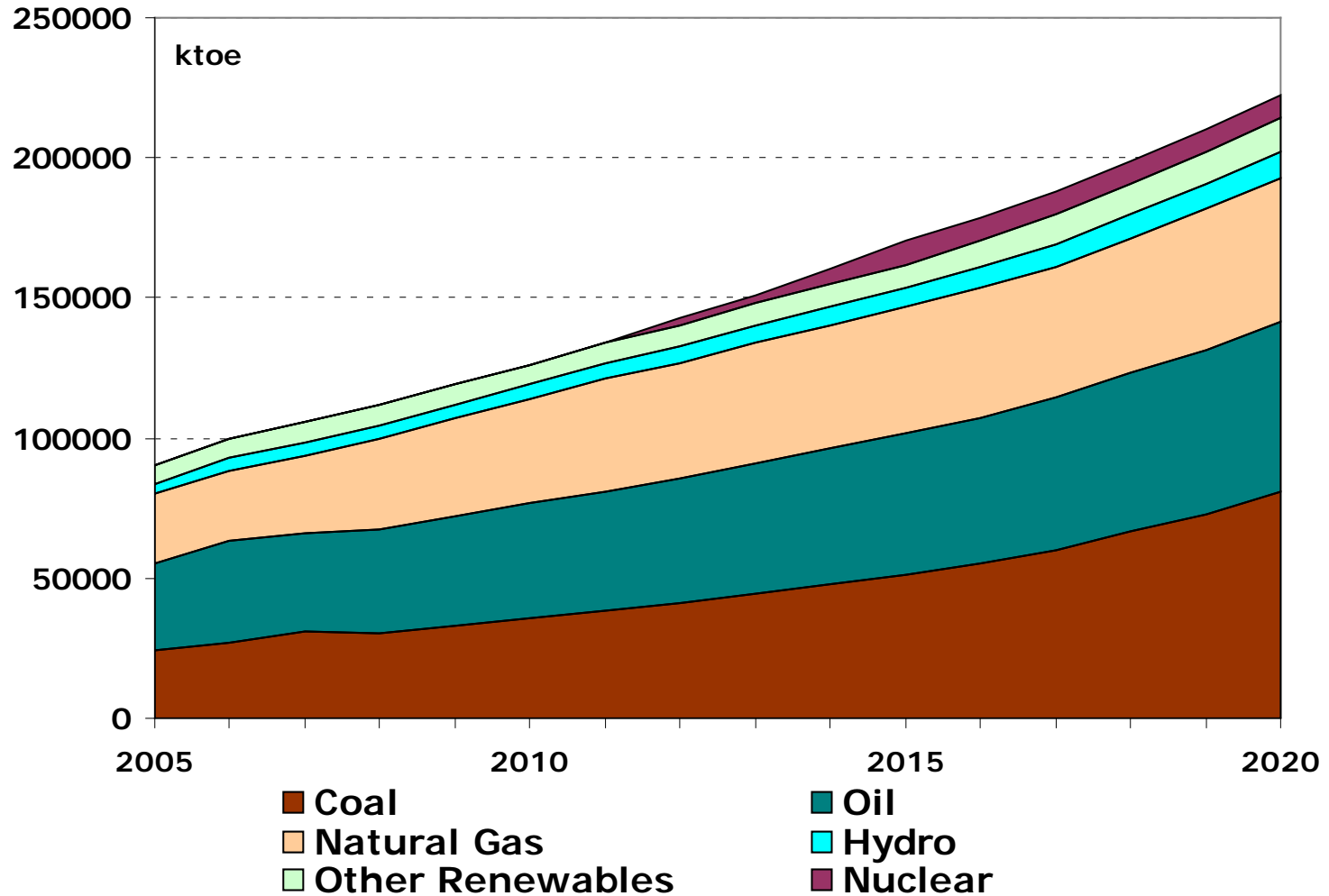
  - 1,184Mt (1990)



- World Hardcoal Reserve : 710.6 billion tonnes
  - Turkey : 1.3 billion tonnes (0.18%)
  
- World Lignite Reserve :279.3 billion tonnes
  - Turkey :11.8 billion tonnes (4.2%)



## TPES by sources (Projection)





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- State-owned companies operating in the sector:
  - **TTK** Turkish Hard Coal Enterprise
  - **TKI** Turkish Coal Enterprises
  - **EUAS** Electricity Generation Company
  - **MTA** Mineral Research and Exploration Company
- TTK was the only company dealing with hard coal production but currently some of the hard coal production in the area is done by private sector companies also.
- VMI rt oducgu about halhof cmignite production (app.45% in 2008)
- EUAS produces lignite for its power plants (app. 46% in 2008)
- MTA carry on exploration studies
- Private companies produce around 9% of total lignite production and currently around 35 % of total hard coal production





- TTK → hard coal fired power plant  
industry (mainly steel production)  
heating
- TKI → EUAS's coal fired power plants  
heating to residences and services  
industry (sugar, textile, bricket etc.)
- EUAS → its coal fired power plants
- MTA → carry on exploration studies
- Private → coal fired power plants  
heating to residences  
industry (mainly cement and sugar sector,)



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- Coal potential has been studied in addition to the existing reserves especially for lignite.
- By exploration studies starting from the year 2005 additional lignite reserves have been found through the country.
- By the addition of these reserves, total lignite reserve reaches to **11,75 billion tonnes.**



## Lignite Reserves (million Ton)

Possible	143
Probable	827
Proven	10,782
<b>Total</b>	<b>11,752</b>

The calorific value of lignite reserves varies between 1000 kcal/kg and 4200 kcal/kg

## Hard Coal Reserves (1000 Ton)

Possible	368,447
Probable	424,955
Proven	526,151
<b>Total</b>	<b>1,319,553</b>

The calorific value of hard coal reserve varies between 6200 kcal/kg and 7200 kcal/kg

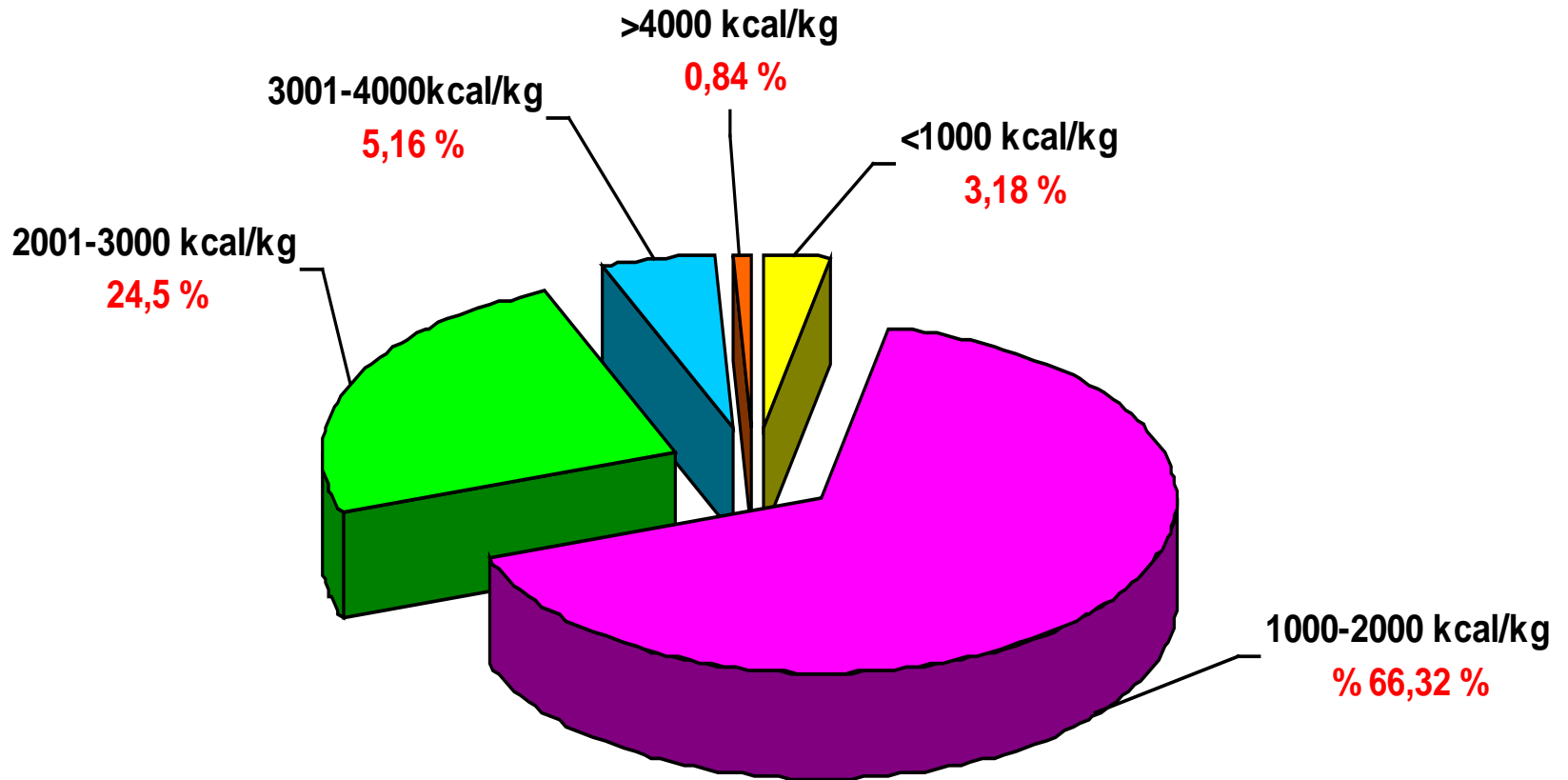


## Distribution of Lignite Reserves

ESTABLISHMENT	REZERV (Bin Ton)			
	PROVEN	PROBABLE	POSSIBLE	TOTAL
<b>EÜAŞ</b>	4,741,300	104,500		4,845,800
<b>TKİ</b>	2,203,394	251,811	1,560	2,556,765
<b>MTA</b>	2,643,196	108,334	2,964	2,754,494
<b>Private Sector</b>	1,094,189	362,122	138,617	1,594,927
<b>TOPLAM</b>	<b>10,782,079</b>	<b>826,767</b>	<b>143,141</b>	<b>11,751,987</b>



## Rank of Lignite Reserves





## OUTLINE

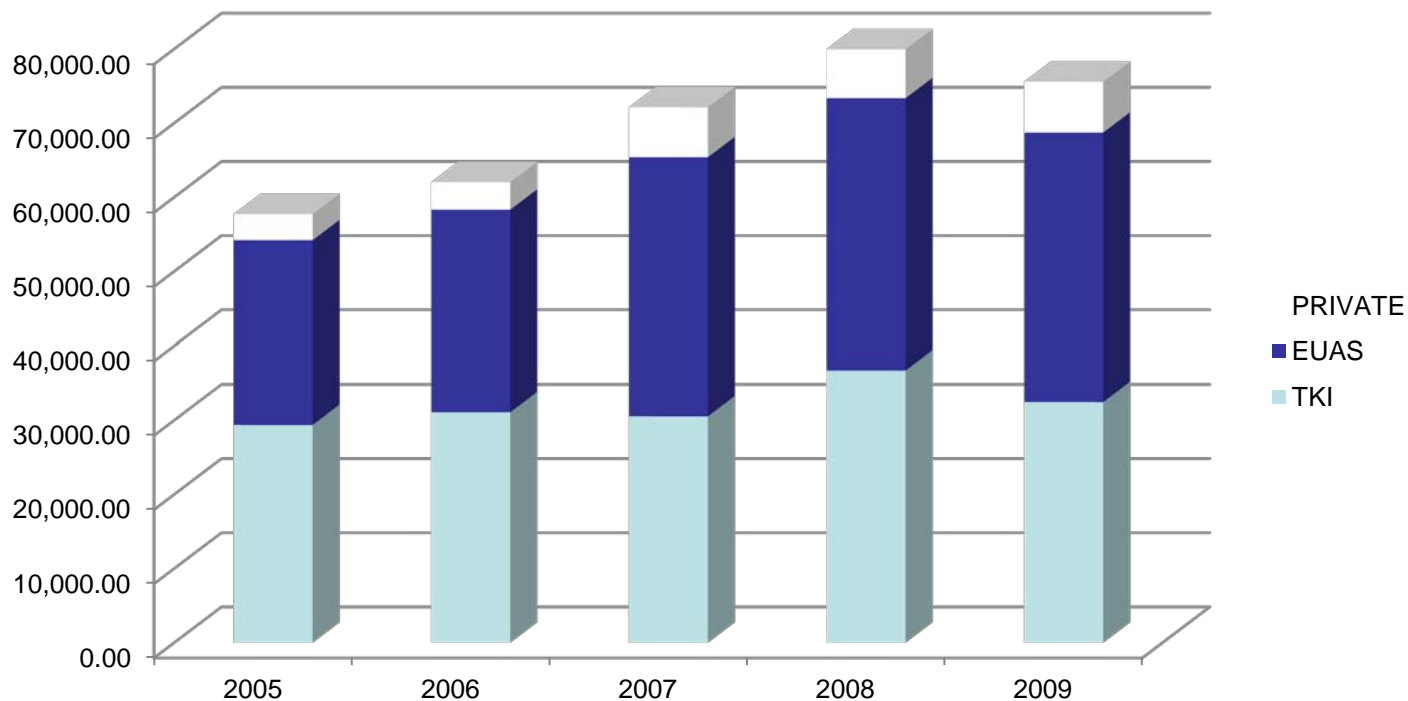
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## Lignite Production (1000 tonnes)

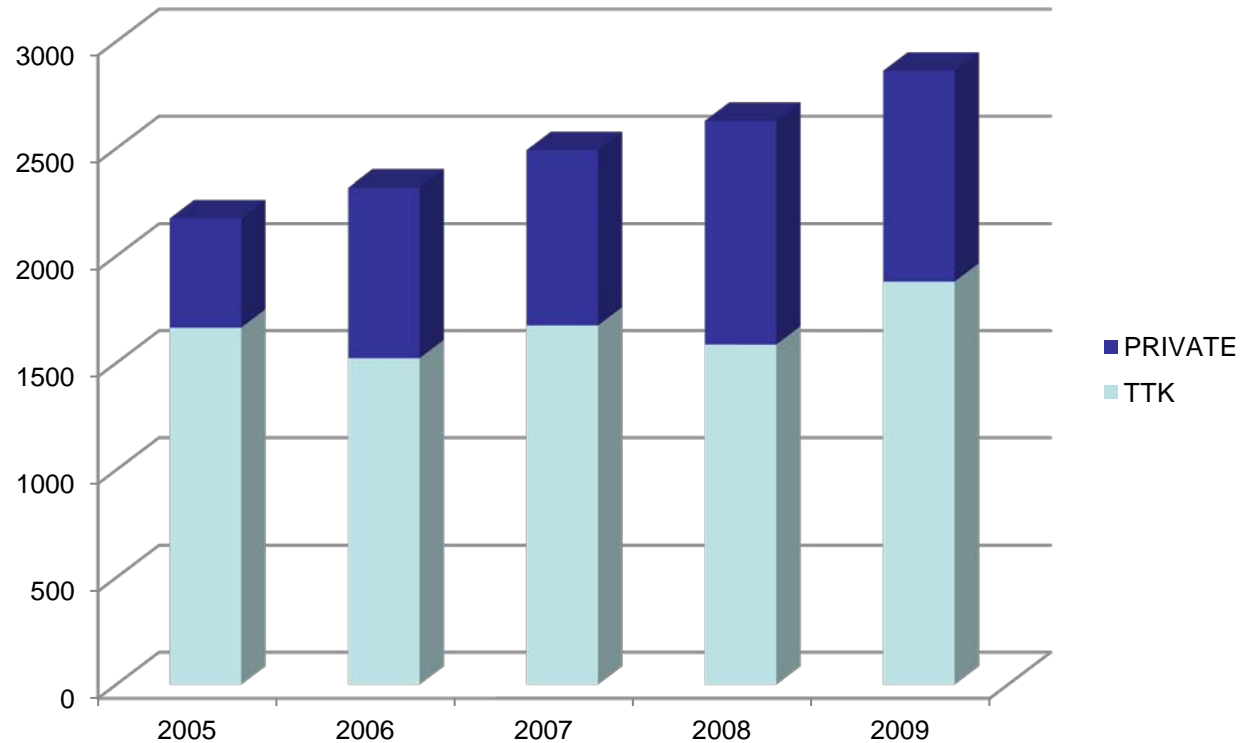
	2005	2006	2007	2008	2009
<b>TKI</b>	29,359	31,074	30,526	36,697	32,451
<b>EUAS</b>	24,844	27,243	34,871	36,658	36,267
<b>PRIVATE</b>	3,505	3,706	6,724	2,816	6,858
<b>TOTAL</b>	<b>57,708</b>	<b>62,023</b>	<b>72,121</b>	<b>76,171</b>	<b>75,576</b>





## Hard Coal Production (1000 tonnes)

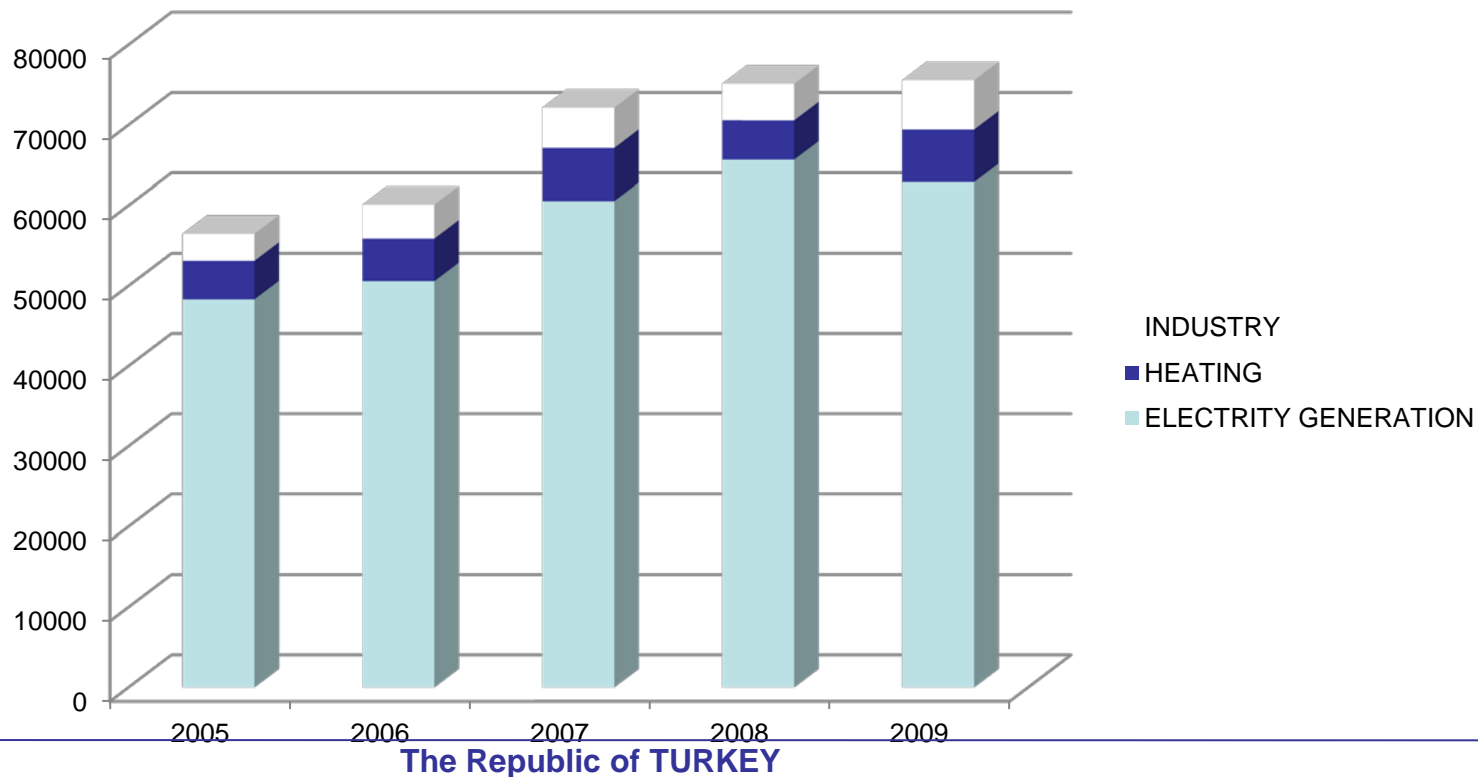
	2005	2006	2007	2008	2009
<b>TTK</b>	1,665	1,522	1,675	1,586	1,880
<b>PRIVATE</b>	505	796	787	1,043	983
<b>TOTAL</b>	<b>2,170</b>	<b>2,318</b>	<b>2,462</b>	<b>2,629</b>	<b>2,863</b>





## Lignite consumption by sectors (1000 ton)

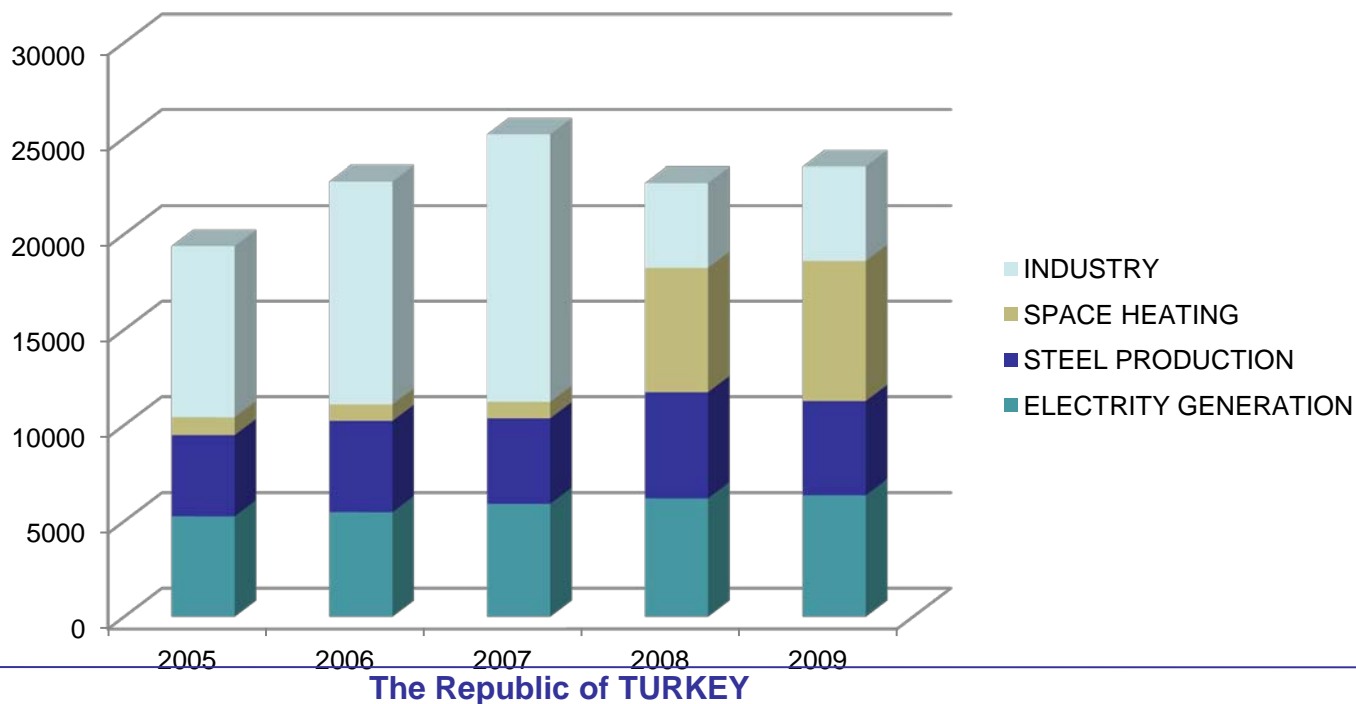
	2005	2006	2007	2008	2009
<b>ELECTRICITY GENERATION</b>	48,319	50,584	60,536	65,685	62,894
<b>HEATING</b>	4,807	5,309	6,602	4,890	6,530
<b>INDUSTRY</b>	3,362	4,211	5,006	4,553	6,142
<b>TOTAL</b>	<b>56,488</b>	<b>60,104</b>	<b>72,144</b>	<b>75,128</b>	<b>75,566</b>





## Hard Coal consumption by sectors(1000 ton)

	2005	2006	2007	2008	2009
<b>ELECTRITY GENERATION</b>	5,259	5,477	5,912	6,197	6,361
<b>STEEL PRODUCTION</b>	4,218	4,745	4,443	5,526	4,900
<b>HEATING</b>	935	865	865	6,516	7,337
<b>INDUSTRY</b>	8,970	11,671	13,984	4,135	4,918
<b>TOTAL</b>	<b>19,382</b>	<b>22,758</b>	<b>25,204</b>	<b>22,374</b>	<b>23,516</b>



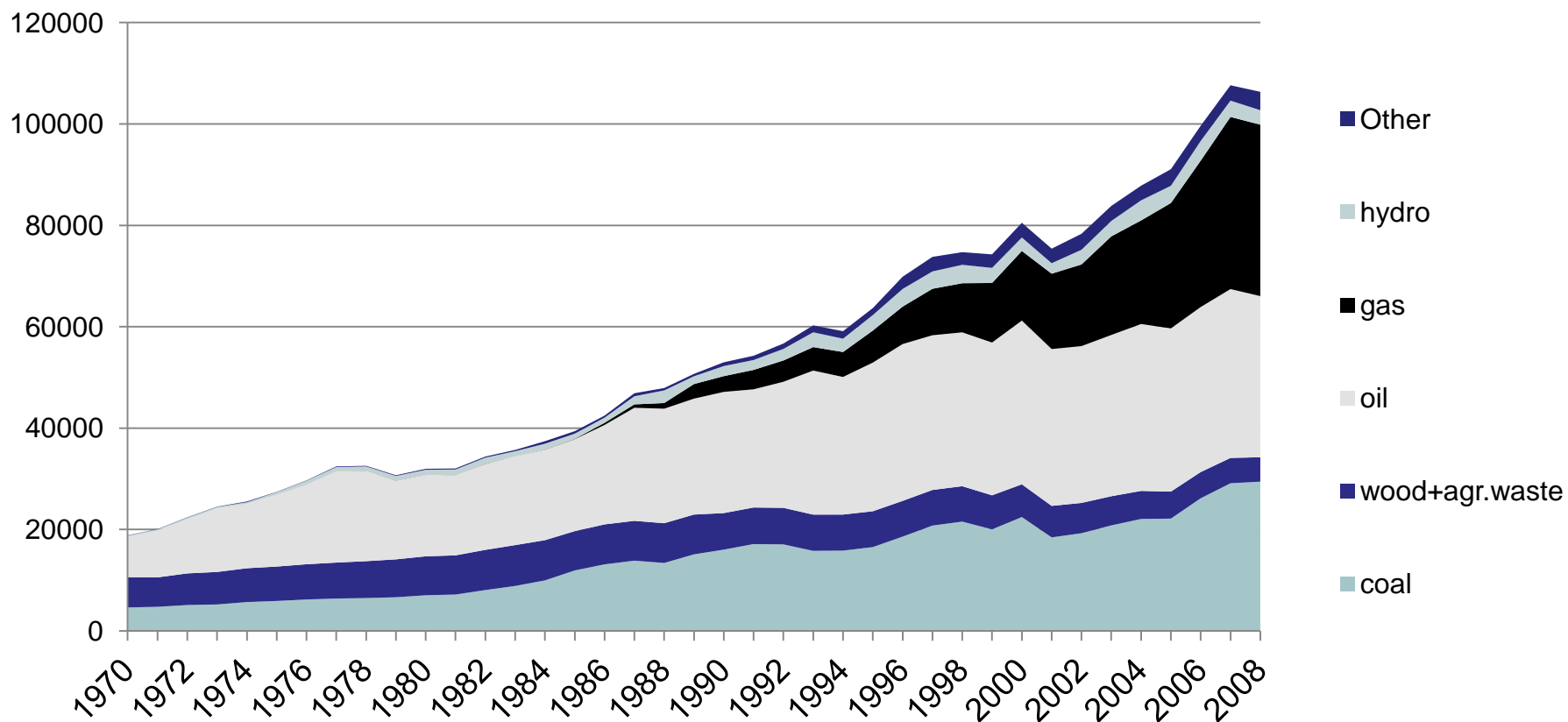


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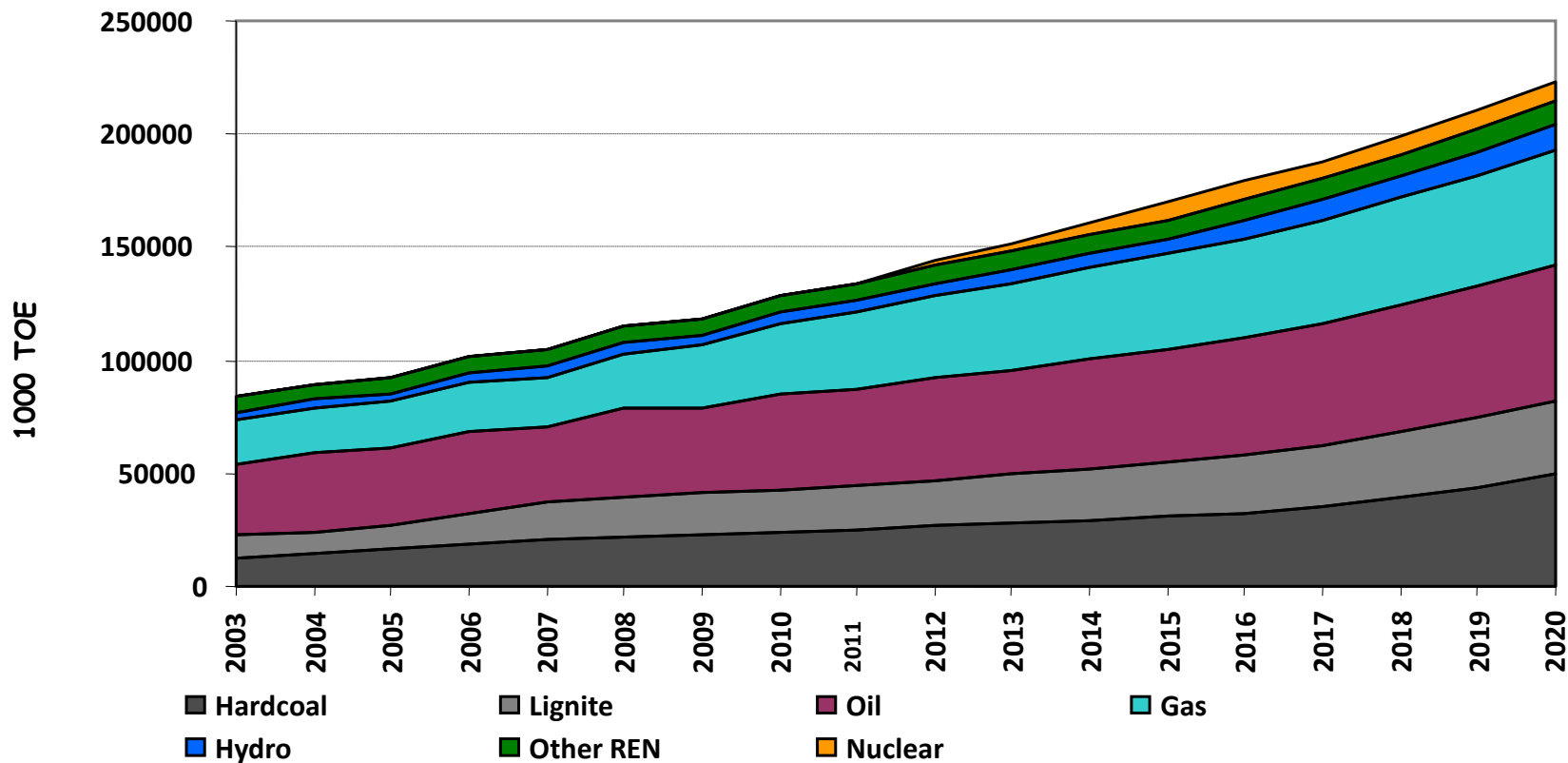


## Primary Energy Supply-1970-2008 (1000 toe)





## Primary Energy Supply-2003-2020

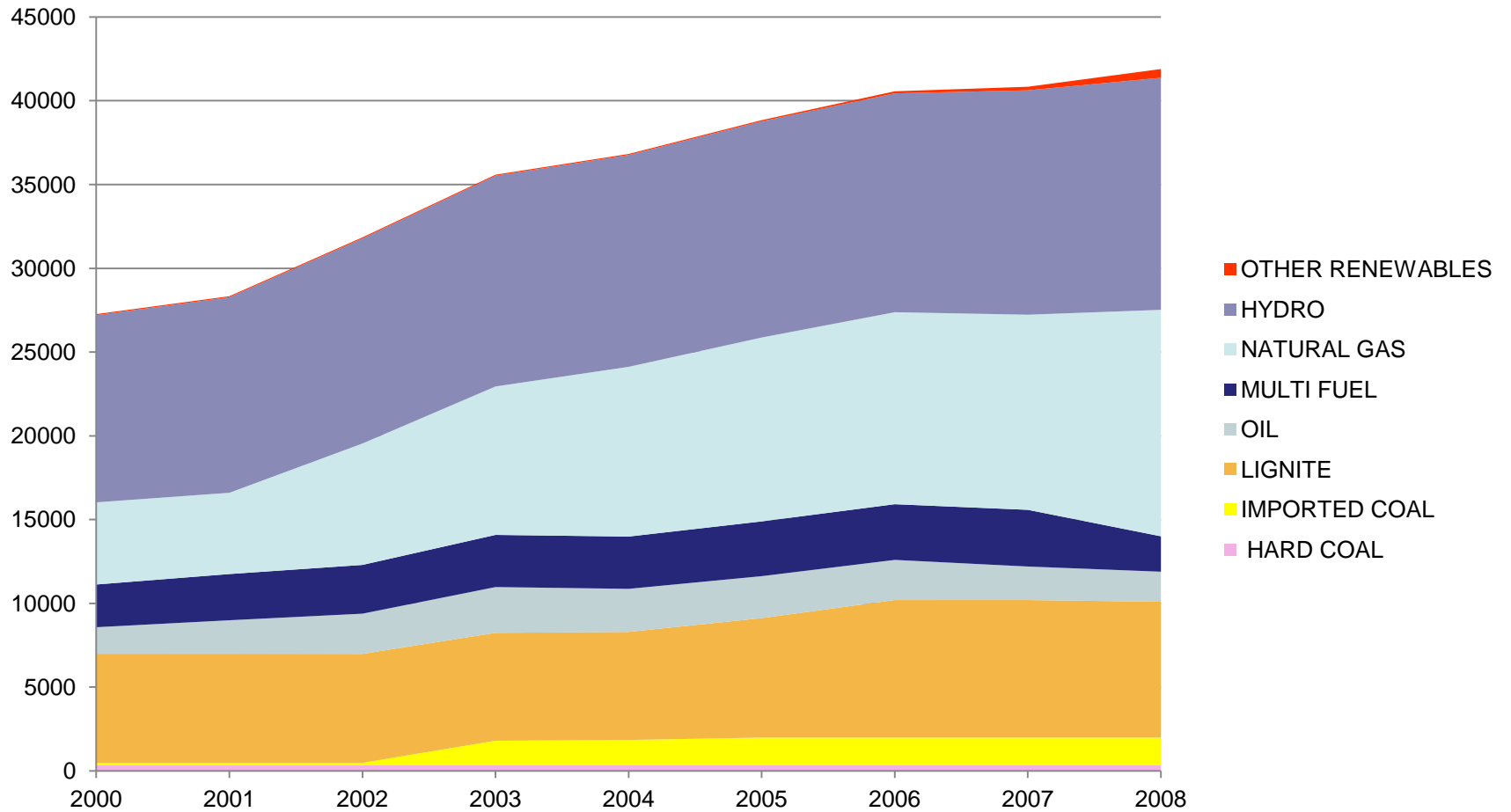


**Primary energy demand will increase by 160% by 2020**

**Import Dependency will keep its level of over 70%**



## Installed Capacity by Fuel (2000-2008)

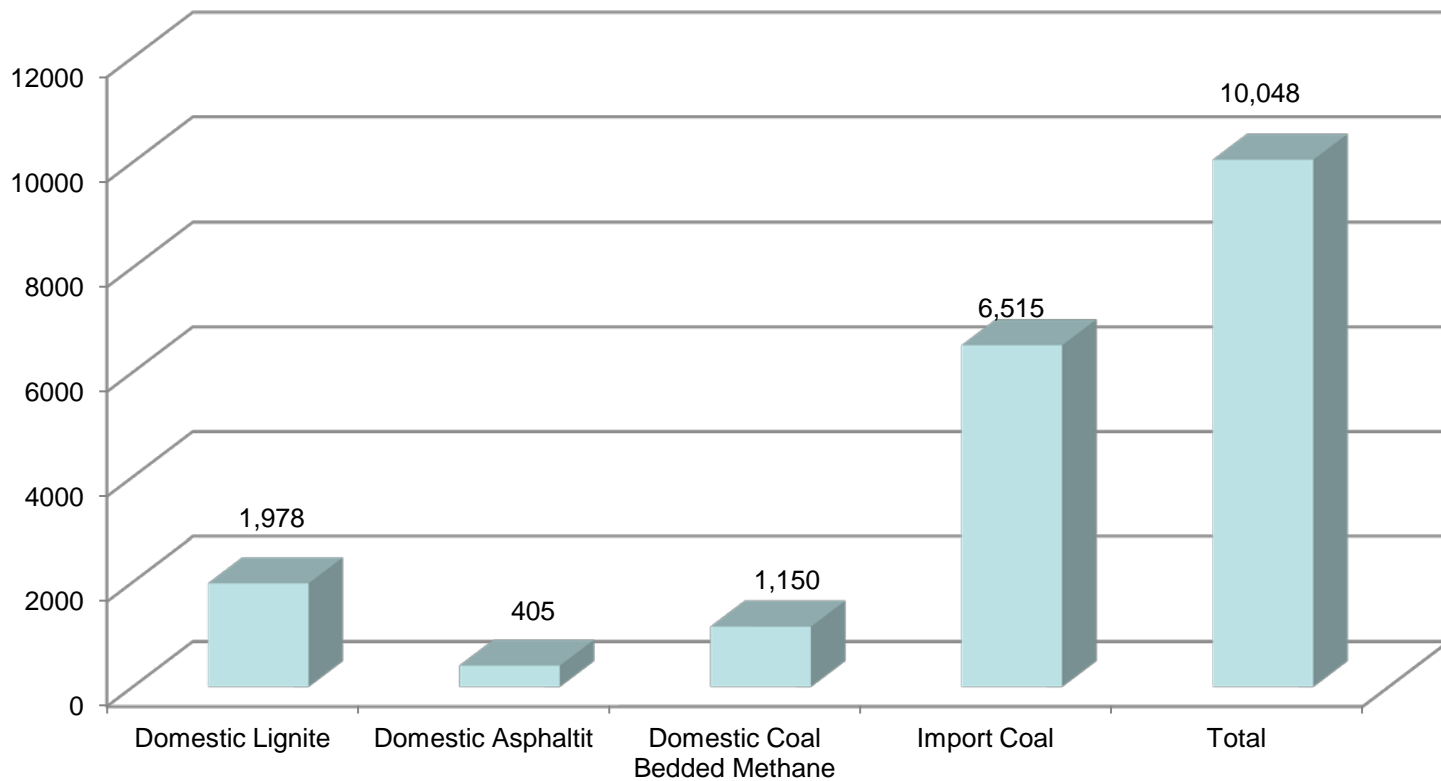






## Coal Fired Power Plant Projects (getting licence above 50 MW)

### Installed Capacity (MW)



Source: EMRA.

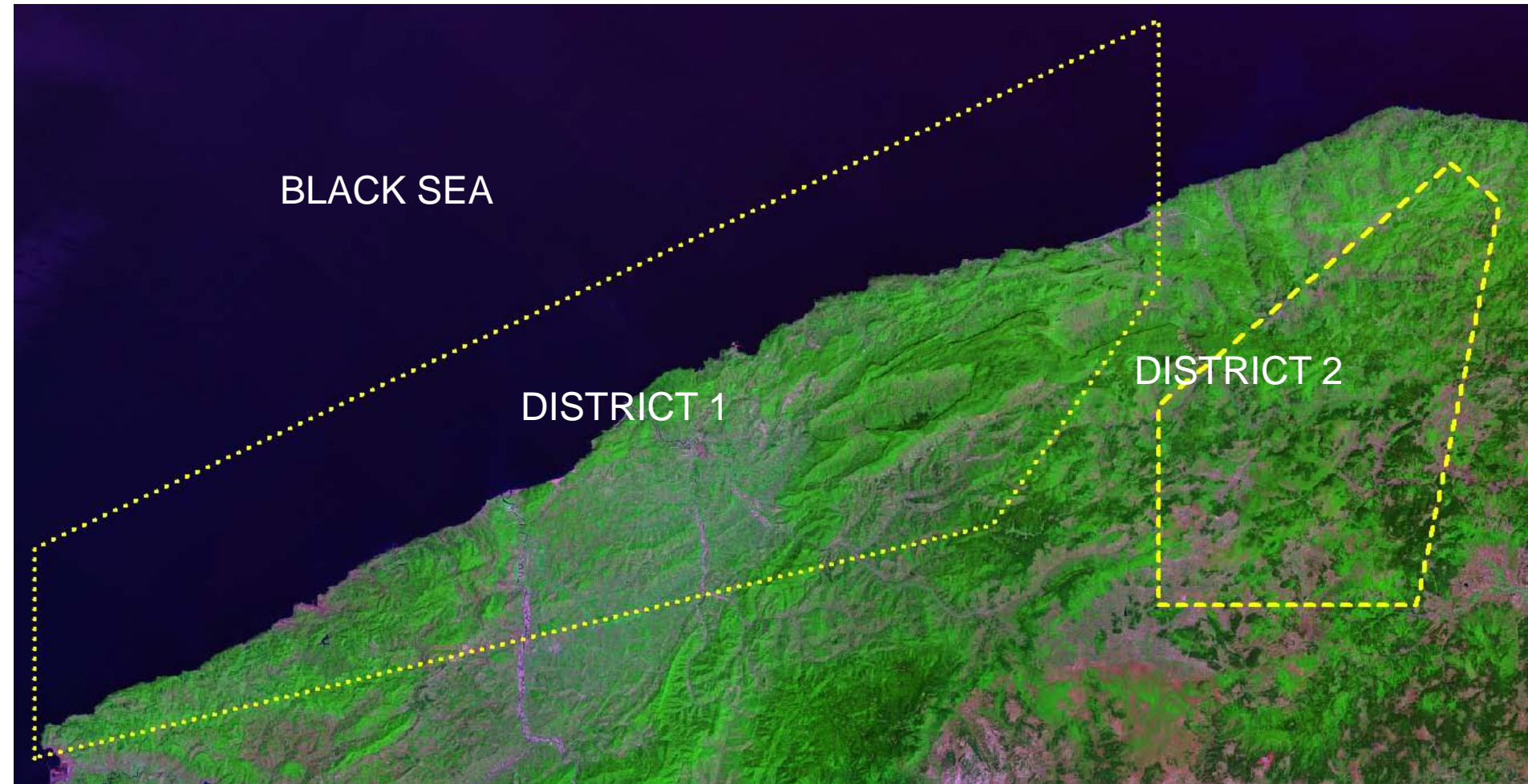


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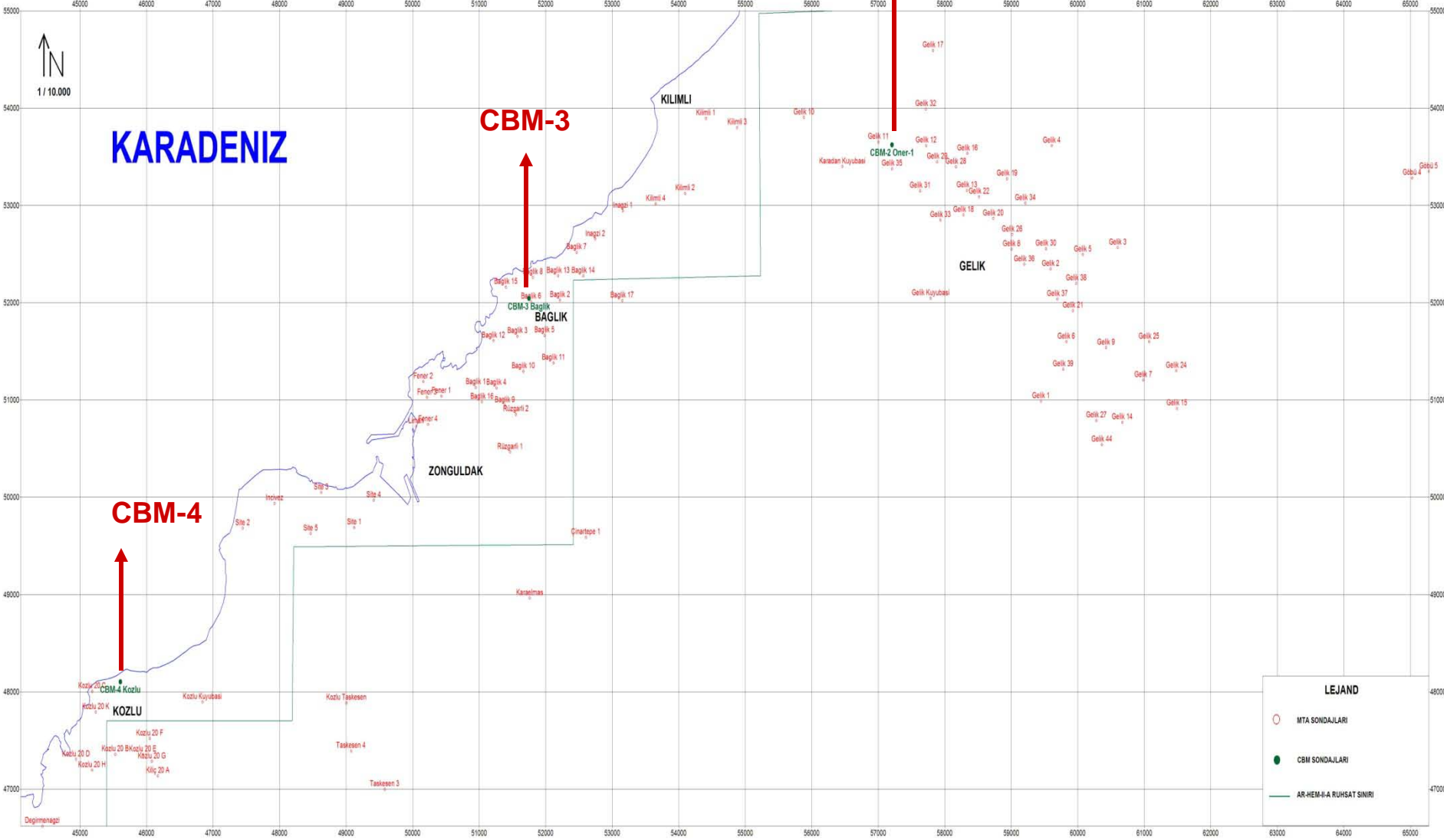
# CBM Exploration and Utilization Project



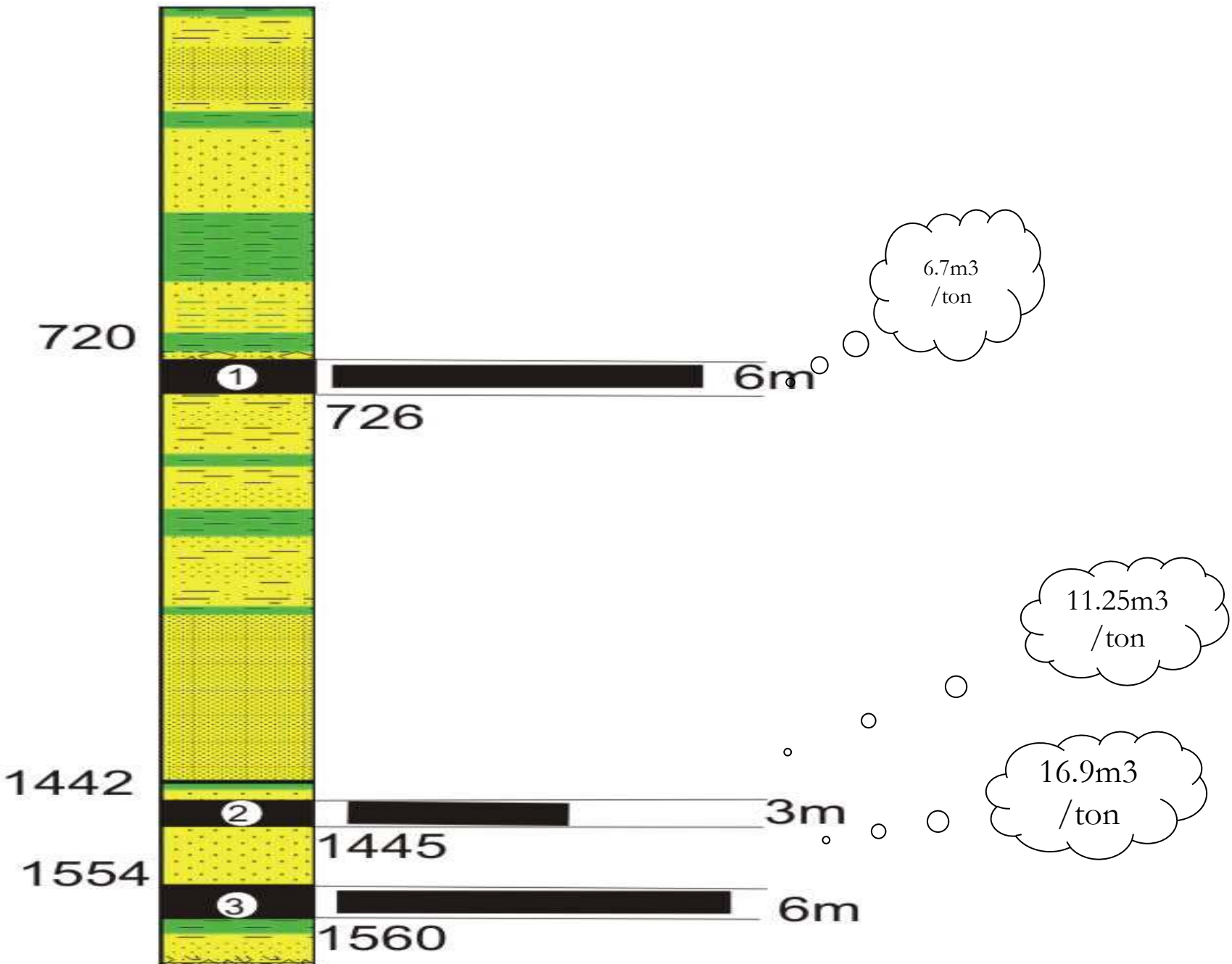


# Zonguldak District

## ZONGULDAK SONDAJ LOKASYON HARITASI



# CBM -1 KUYUSU







# Developments in CBM Studies

- Starting from the year 1972, the studies for coal bed methane have been carried out in Zonguldak basin.
- Studies were mostly related with safety concept of a underground hard coal mine to be able to get rid of accidents(methane drainage)
- Later on several times the region have been awarded for exploration and utilization of CBM in the basin.
- In 08.03.2005 a contract has been signed by TTK and HEMA Cooperation. By this agreement the region is contracted to the company by 15 years including 2 years exploration studies.
- The studies within the context of the agreement have been carried out by the company in the region. Recently, it is assumed that there exist around 60 bcm of CBM potential which 10 bcm of it can be recoverable.



**TÜM ÇALIŞMALARIN BAŞARILI  
SONUÇLANMASI DİLEĞİ İLE !!!**







# Main Strategies in the Sector

- Ensuring the diversification of primary energy sources, reducing the import dependency and increasing the share of indigenous sources for supply security,
- Utilization of known lignite and hard coal reserves till 2023 for electricity generation,
- Increasing the ratio of power plants running with domestic coal in the portfolio
- Power plants running with high quality import coal will also be preferred considering supply security
- Exploration of new coal fields and increasing coal production
- Utilisation of clean coal technologies to minimize the adverse effects of coal on the environment



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