

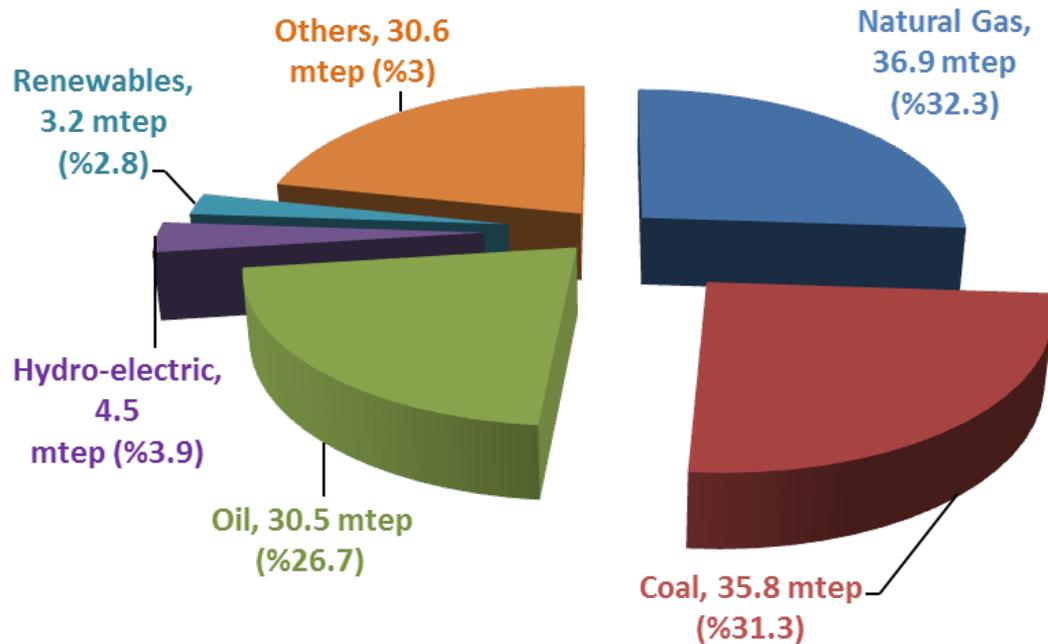
Turkey's Coal Sector Update to the 18th Session of the Global Methane Initiative (GMI) Coal Subcommittee

19-20 November 2013
Turkish Coal Enterprises (TKI)



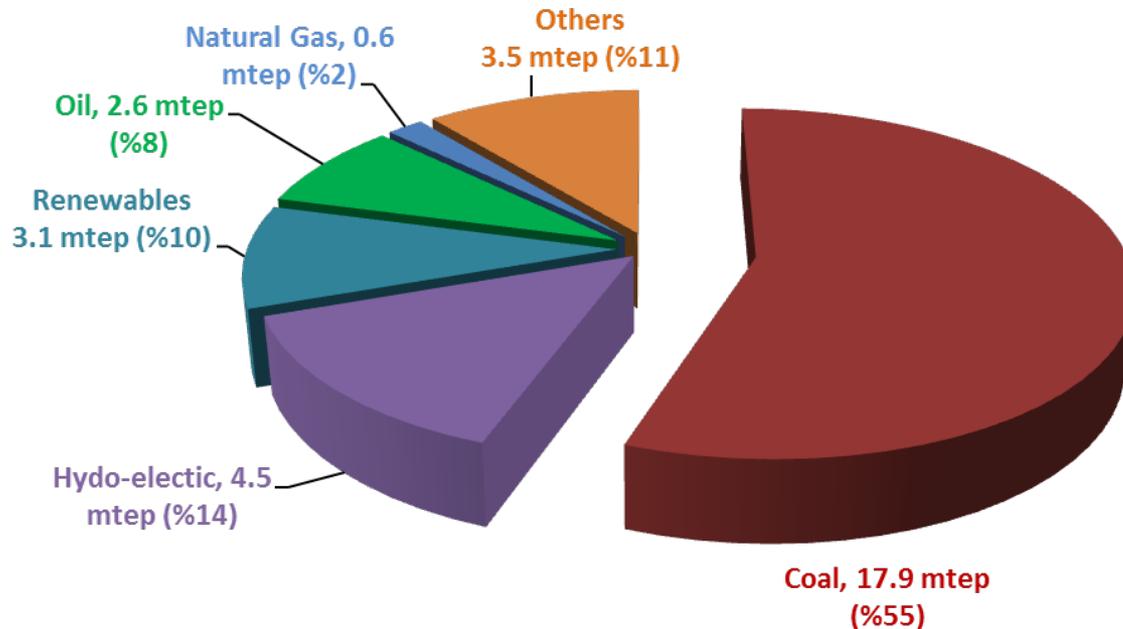
Turkey's Coal Sector Update

- Overall energy supply
 - Energy supply increased to 114.4 million tons of oil equivalent in 2011.
 - %4.5 increase compared to 2010.
 - Increasing trend is expected



Turkey's Coal Sector Update

- Domestic energy production
 - As of the beginning of 2012 domestic energy production decreased by %1 - 32.2 mtep.
 - Coal is the primary source of domestic energy production (17.9 mtep - %55).

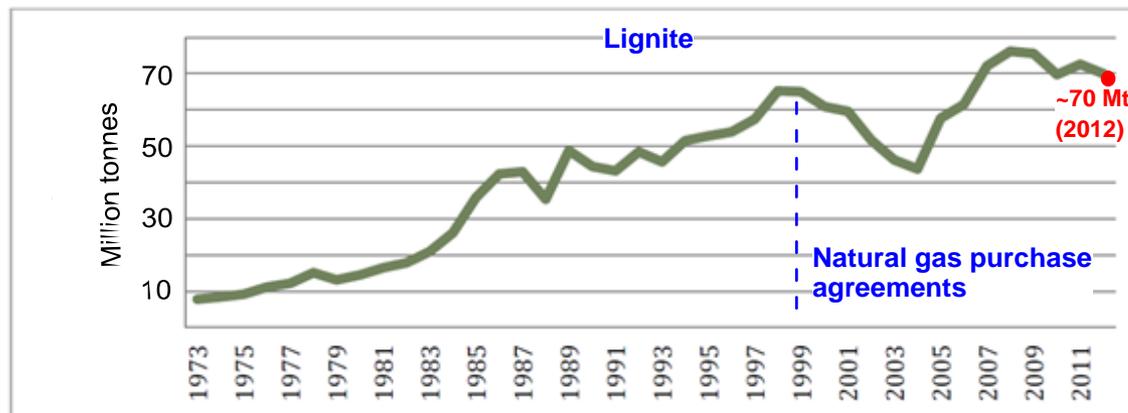
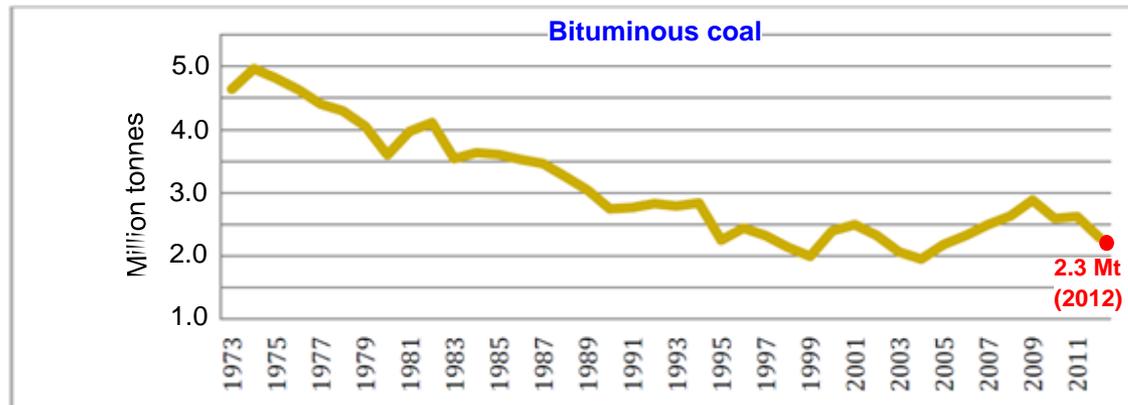


Turkey's Coal Sector Update

- Domestic energy production versus energy consumption – current outlook and **forecast (2020)**
 - 10-year average: Energy consumption +%52, domestic energy production +%31.
 - 2012 - the ratio of domestic energy production to energy consumption is %28 (20 years ago - %47, 10 years ago - %33).
 - Decreasing ratio increased the need for energy import.
 - **Share of nuclear energy - %4**
 - **Share of domestic coal in total energy supply - ~same**
 - **Coal import will increase - ~ x2 (19% in total)**

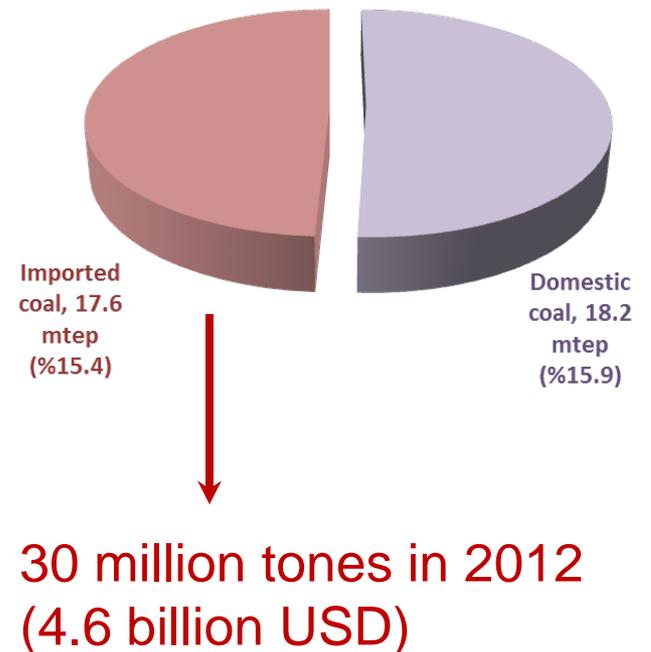
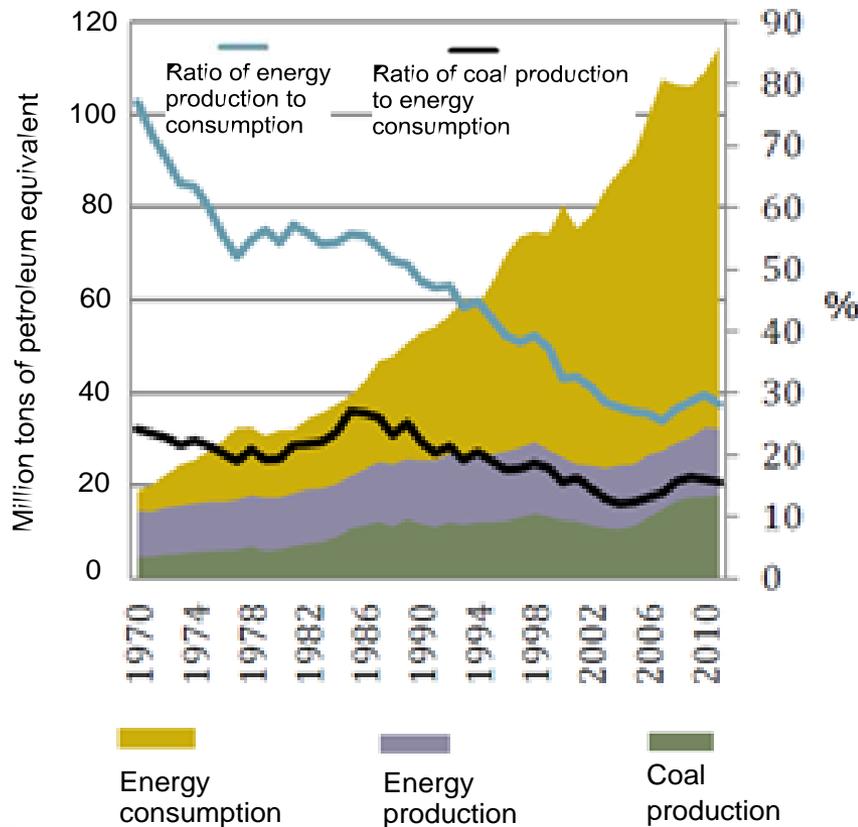
Turkey's Coal Sector Update

- Coal sector trends and analyses
 - Coal production having difficulty in keeping up with energy demand



Turkey's Coal Sector Update

- Coal sector trends and analyses
 - Domestic coal production meets ~%16 of energy consumption



Turkey's Coal Sector Update

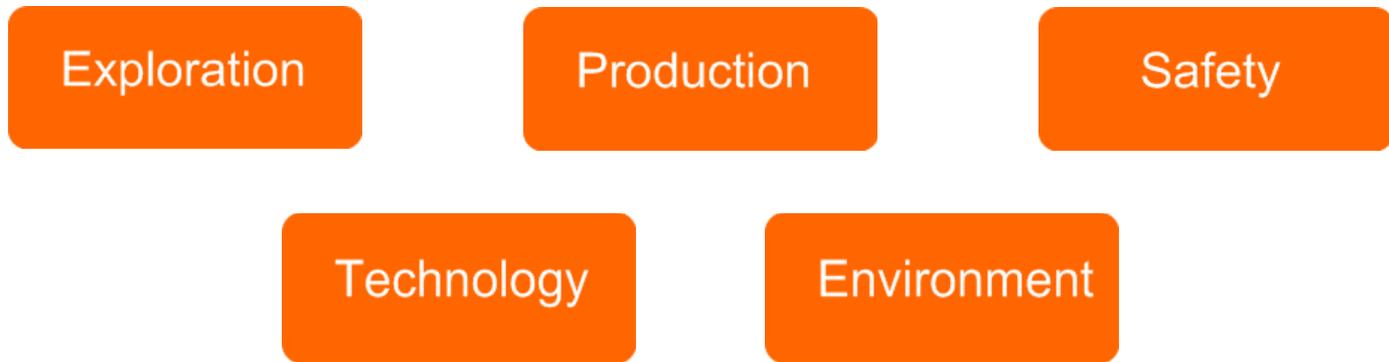
- Regulatory issues and updates
 - Coal is produced according to 3213 numbered Mining Law - dates back 1985
 - Presence of encouraging technical and legislation know-how
 - Problems is adaptability of the mining legislation to solve the unique problems related to coal sector
 - Uncertainty in privatization policies
 - Existing legal arrangements preventing the public from making investments
 - Public reaction to changes
 - Incentives and waivers exist depending on the investment and its proposed locations in the country

Turkey's Coal Sector Update

- Projects are dictated by reality and needs
- Some facts that dictate national plans and directions related to coal sector
 - Trend and projections show that coal import will increase
 - Vast reserves of lignite (~14 billion tons – 2013) – Mostly low quality; %90 of lignites is under 3000 kcal/kg.
 - Most of the domestic and imported coal is used in electricity generation.
 - The share of domestic coal in electric generation is decreasing with a fast pace.(~%15).
 - Total bituminous coal reserve is 1.5 billion tons. High quality (~ 6500 kcal/kg), but mined at difficult conditions with high cost.

Turkey's Coal Sector Update

- General framework of current coal projects



"capitalizing the energy and natural resources in a productive, effective, safe, timely and environmentally friendly manner so as to decrease foreign source dependency of the country, and to make the utmost contribution to the welfare of the country."

Turkey's Coal Sector Update

- Current projects and driving forces
 - Higher CO2 emissions per heat value
 - High sulphur content

Technology

Gasification of Soma-Eynez coal to produce SNG and by products

300 MW Integrated Gasification Combined Cycle with Petrochemical production – Soma Coal

Environment

Lignite gasification using plasma- laboratory scale units completed

Coal biotechnology to convert coal to humic acid, methane gas using Bursa – Davutlar lignite

Coal enrichment projects for better utilization

Turkey's Coal Sector Update

- Current projects and driving forces
 - Coal and rock outbursts, explosions
 - Methane emissions

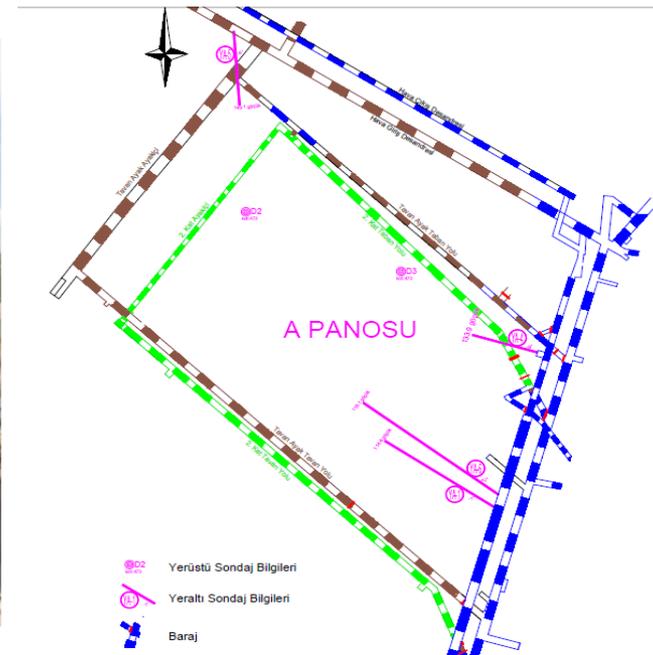
Safety

Degasification project in Zonguldak and Amasra - prefeasibility

Soma-Eynez degasification project – problem and Initial findings presented at GMI meeting in Vancouver

Turkey's Coal Sector Update

- Current state of the Soma-Eynez degasification
 - Final decision is to drill gob gas ventholes
 - Four underground boreholes were drilled to monitor the gob during mining and also degasification



CMM Project Outlook

- Challenges to emission reduction projects in Turkey:
 - Insufficient resources being allocated.
 - Weak relations between universities and energy sector in this field
 - A substantial number of thermal power stations based on coal being close to completing their economic lives
 - Uncertainty in privatization policies
 - Fluctuations in the coal sale amounts due to the global economy
 - Absence of legislation in methane control in coal mines and release to atmosphere

CMM Project Outlook (2) – All applies to Turkey

- Approaches to overcoming challenges
 - Legislation and regulation
 - Policies and incentives
 - Energy pricing reform
 - Capacity building
 - Technology transfer
 - Training and workshops
 - Agreements and/or partnerships

Turkey's Coal Sector Methane Action Plan

- Status of Coal Sector Methane Action Plan development – in progress
- Stakeholders should be defined and feedback should be sought
- Assistance from relevant government bodies is absolutely needed – statistical data and data evaluation, legal help, technical input etc.
- Feedback and commitment from private sector
- Timeline is based on country development plans for a realistic and implementable action plan
- Financial commitment to the plan

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