



# Importance of Coal in Pakistan's development

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# Potential of Growth in Pakistan

- Pakistan's Economy is continuously in deep crisis
- Pakistan's unutilized resources are enormous
  1. Human Resources (headcounts, intelligence, hardworking abilities, Honesty)
    1. Labor
    2. Management
  2. Land (Agriculture Products, Minerals, Water courses, Seaports, Roads)
  3. Capital (Foreign and Domestic Capital is lying unutilized ready to be invested in productive activities due to better rate of returns possible in Pakistan)

# Hurdles in Possible Growth in Pakistan

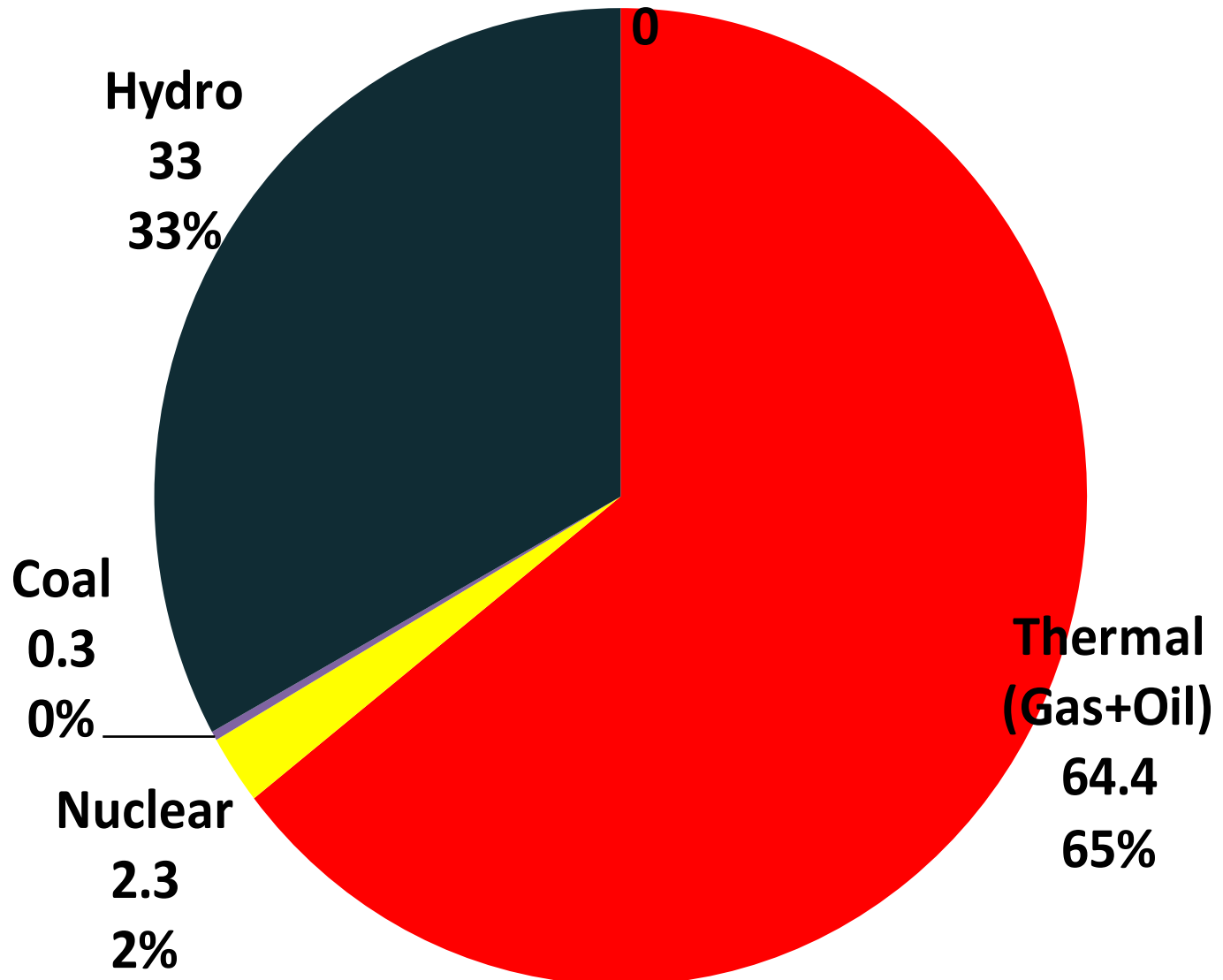
- Political Instability in Pakistan and its surroundings  
(this is not our subject for this seminar)
- Inability to meet Heat and Power requirement  
(this is our subject for this seminar)

# Hurdles in Possible Growth in Pakistan

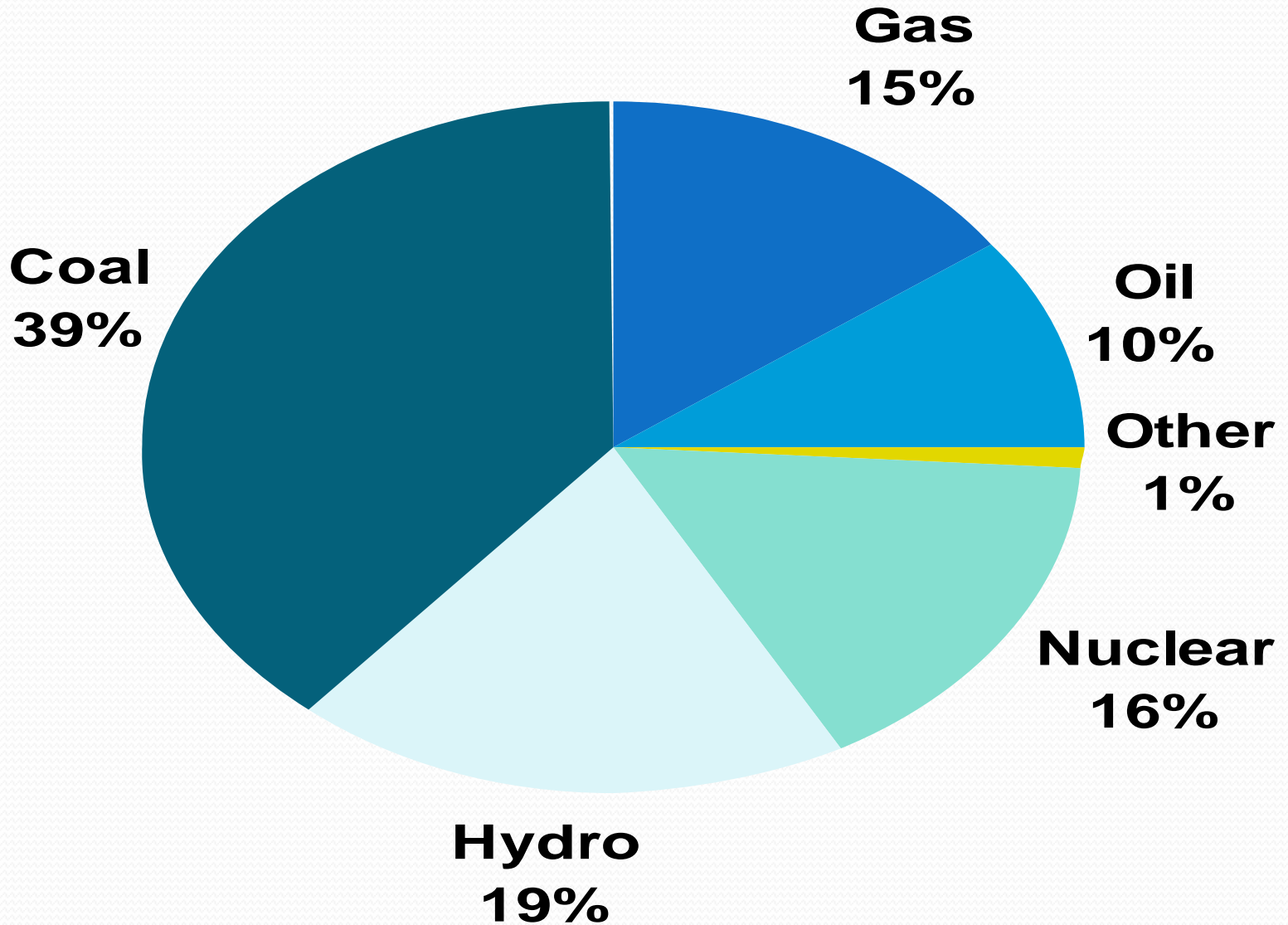
- Inability to meet Heat and Power requirement  
(this is our subject for this seminar)

Current Power Production MW	14,000
Current Power Need	18,500 MW
Year 2020 Power Need	26,000 MW

# Present Sources Of Heat and Power in Pakistan



# Present Sources Of Heat & Power Worldwide



# Shocking Observations

- The previous two Charts reveal two shocking things
  1. In Pakistan we are trying to meet our Heat & Power requirement from most scarce and expensive resources (opposite to worldwide pattern)
    1. Oil
    2. Gas
  2. Coal which contributes Worldwide 39 % to meet Heat & Power requirement contribute almost NIL for Pakistan (Coal is Pakistan's domestic resource and we are among the first few having huge coal resources)

# in Pakistan

- The different resources for meeting Power and Heat requirement are
  1. Water
  2. Oil
  3. Natural Gas
  4. Nuclear
  5. Wind
  6. Solar
  7. Coal

# in Pakistan

## 1. Water

- Contribute 33% towards meeting Power requirement.
- Very Scarce and have competitive usage (Irrigation); Reason for Political disputes
- Development requires huge Capital Investment
- Development requires Long term Planning (10-20 years); not immediate solution

# Status of different Fuels in Pakistan

## 2. Oil

Contribute 30% towards meeting Power requirement.

Very Scarce

Import based

Worldwide becoming more and more scarce

Already expensive and becoming more and more burden on Pakistan's scarce Foreign Exchange

# Status of different Fuels in Pakistan

## 3. Natural Gas

Contribute 30% towards meeting Power requirement.

Because of unmindful use during last two decades have become extremely scarce

Domestic is not available in enough quantity

Import is Long Term Project and will be expensive

Will become Burden on Pakistan's scarce Foreign Exchange

# Status of different Fuels in Pakistan

## 4. Nuclear

Contribute 2% towards meeting Power requirement.

Extremely difficult to increase capacity; Long term project (10-20 years)

Huge Investment required

Can not contribute to quantum jump

# Status of different Fuels in Pakistan

## 5. Wind & Solar

Contribute 0% towards meeting Power requirement.

Technology is expensive (high Investment) and will take long time to introduce

Huge Investment required

Can not contribute to quantum jump

More useful in conservation rather Generation

# Status of different Fuels in Pakistan

## 6. Coal

Contribute 0.2 % towards meeting Power requirement.

Some use in Heat requirement

Huge domestic resources

May resolve within 6 months Captive Heat and Power requirement at reasonable price. Availability of useable coal is still problem

Not Environment friendly

Need some innovative approach

Need people who may take Initiative

Can contribute to quantum jump if right Coal policies adapted

# How Industry may look for solving Power and Heat Problems using Coal

Coal may be used for generating Power or Heat for Captive Use

- By burning Coal
- By Gasifying Coal

# How Industry may look for solving Power and Heat Problems using Coal

Burning of Coal option is already in practice (but on a smaller scale). Its use will be increased with the passage of time.

# How Industry may look for solving Power and Heat Problems using Coal

Coal Gasification is a relatively new technology introduced in the world. It is commonly known as UCG (Underground Coal Gasification). In this Coal is Gasified in the mine and used to Generate Electricity which is distributed thru National Grid. This solution is only possible at the Government level (IPPs).

It requires Investment in billions of USD and execution period of 3 to 4 years.

# How Industry may look for solving Power and Heat Problems using Coal

Coal Gasification is also possible on a smaller scale (2 to 15 MW power or 9000 to 72000 cu mtr / hour of Syngas (Coal Gas) for heating purpose.

This Coal Gasification will serve those industrialist who have big Sales and require captive power at reasonable cost to avoid Loss of Sales or even shutdown or Loss of Profits.

# How Industry may look for solving their Power and Heat Problems using Coal

Coal Gasification for Captive purpose ( 2 to 15 MW) will require:

- 1 Acre to 5 Acre of Land
- Civil Construction
- Gasifiers (3.4 M dia) from 1 to 10 Nos.
- Coal Gas Generators (may operate on CO+H<sub>2</sub>) from 2 to 50 Nos.
- Investment in Capital equipment and Civil Constructions valuing \$ 2,000 per KWH approximately
- Investment in Coal @ \$ 180 per MT approximately
- Unit of Power from Coal Gas will be Rs. 12 per KWH approximately
- Skilled Human Resource 20 to 30 persons

# How Industry may look for solving their Power and Heat Problems using Coal

And will give

Payback period

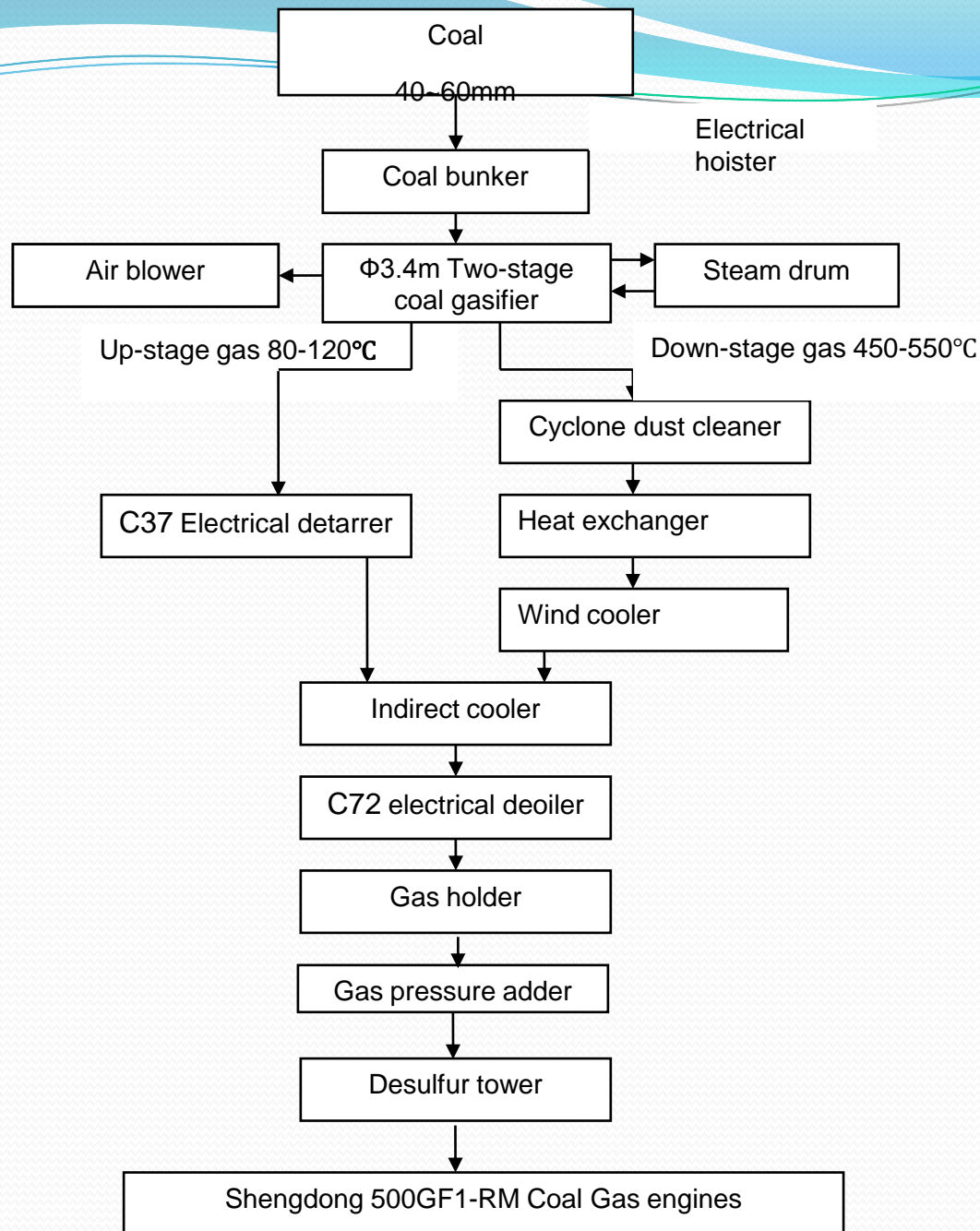
- Against Diesel Generation (Rs. 28 per KWH) less than a year
- Against Natural Gas (shortages for 4 months @ Rs. 6.50 per KWH) less than a year
- Against Grid (non availability due to interruptions for more than 6 months @ Rs. 11 per KWH) less than a year

# their Power and Heat Problems using Coal

- Under present circumstances Industry will have to depend on Imported Coal @ \$ 180 (Rs. 15,000) per MT
- Pakistani Industries solutions for Power and Heat should not be left on Coal from foreign market. The price will increase very fast and may leave the projects unfeasible in near future.
- Local Coal presently Rs. 7,500 (\$ 80) per MT is the only real solution. The prices in near future will go up but still will remain much below International Coal prices
- Industrialists from Mining Industries and Coal Technologists will have to come forward (their business opportunity) to make efforts to develop coal mines with better quality of Coal Mines

# What Companies like Shengdong and Morgan may offer to Industries in Pakistan

- Coal of the Quality and in required Quantity which will give efficient Power and Heat to the Industry
- Gasifiers with technologies suitable for converting low cost coal into efficient Coal Gas. Shengdong being a solution provider and research based company is continuously investing in improving the Technology and Efficiency of Gasifiers
- Coal Gas Generators for converting Syngas into Power with efficiency. Shengdong being a solution provider and research based company is continuously investing in improving the Technology and Efficiency of Gasifiers
- Burners for converting Syngas into Heat with efficiency
- Shengdong offers complete solution (Designing, Consulting, Installation and Commissioning and After sales Services











THANK YOU