

# Come September: Can coal-based power plants sing a happier tune?

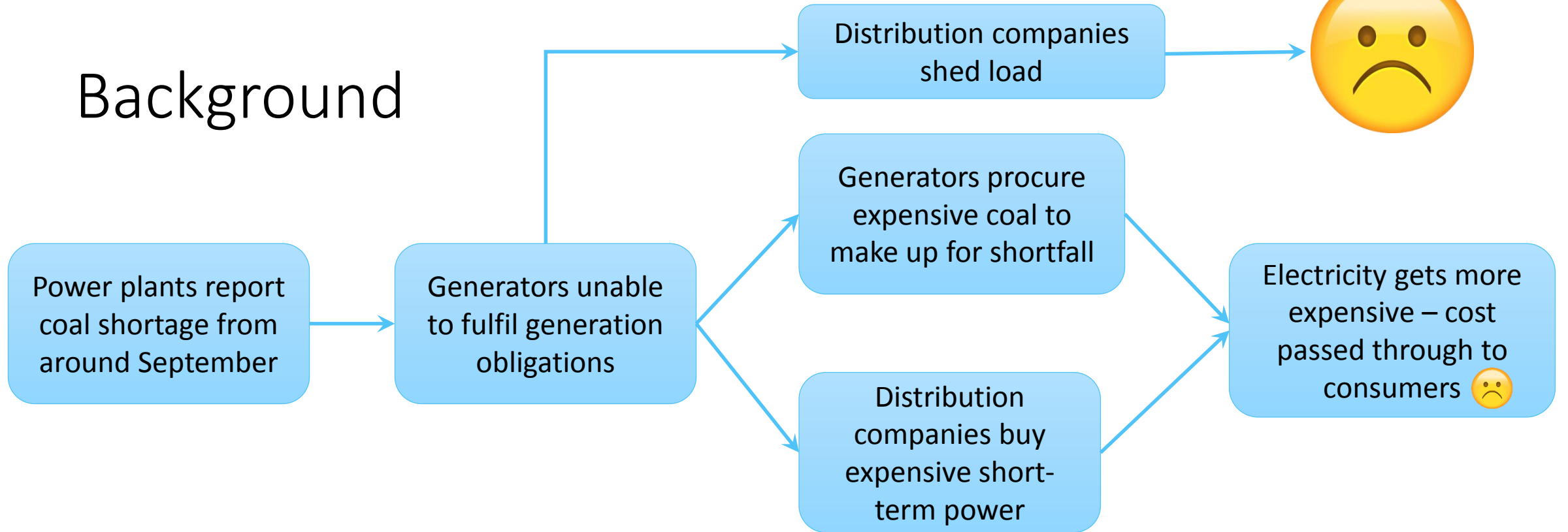
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# Background



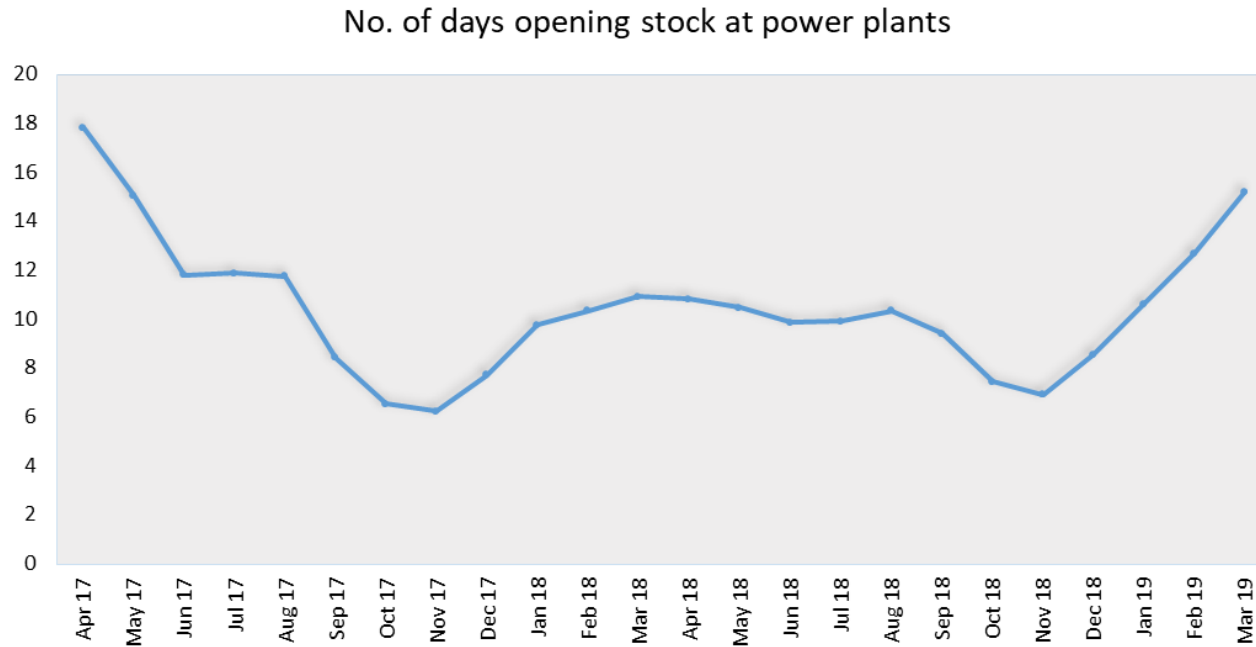
- Shortage of “linkage” / “FSA” coal: long term contracts, at notified prices
- Other sources of coal: imports and e-auctions
  - More expensive alternatives
- Important to understand reasons behind shortage as it affects consumer tariffs and increases imports

# Objectives and methodology

- To understand coal stock and supply situation, i.e. extent of shortage
- Explore possibilities of addressing the shortage problem
  
- Analysis of two years' linkage coal supply, stock and generation data
- National level study
  - Inter-state, inter-plant disparities not part of this study though they are also important
- Over 80% of domestic coal-based capacity considered
- Focus on CIL – supplies ~90% of linkage coal
- Analyse possible future solutions by applying it to past two years' data

# Coal stock and supply

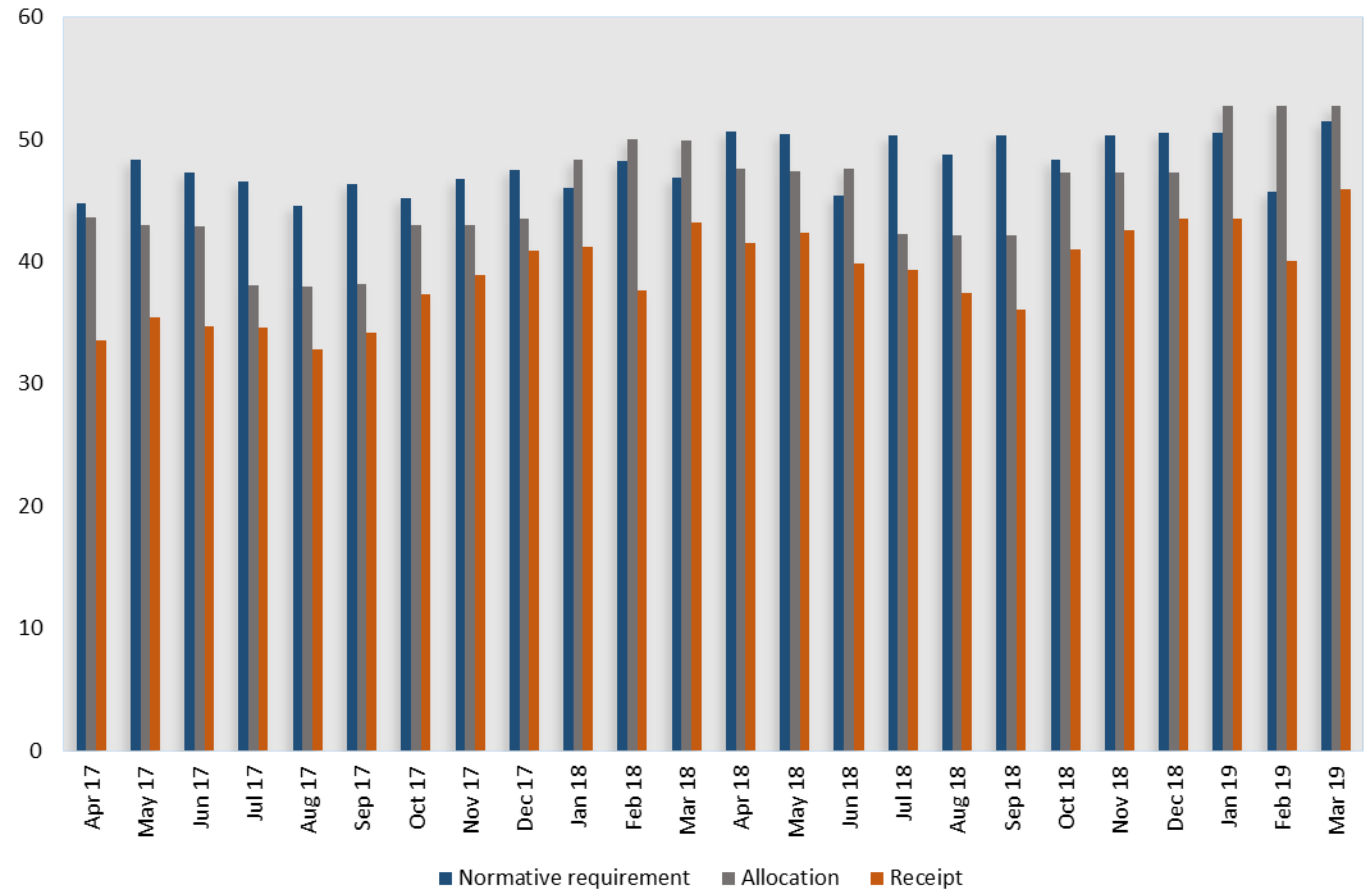
# How many days of stock do power plants have?



- Power demand increases post-monsoon even as hydro, wind generation fall => extra pressure on coal based generation
- Coal stock at power plants falls to critically low levels in Sep, Oct, Nov
- Stock levels typically below 10 days in these months even at 70% PLF
  - As against CEA requirement 20-30 day stock @85% PLF

# Coal requirement, allocation and receipt

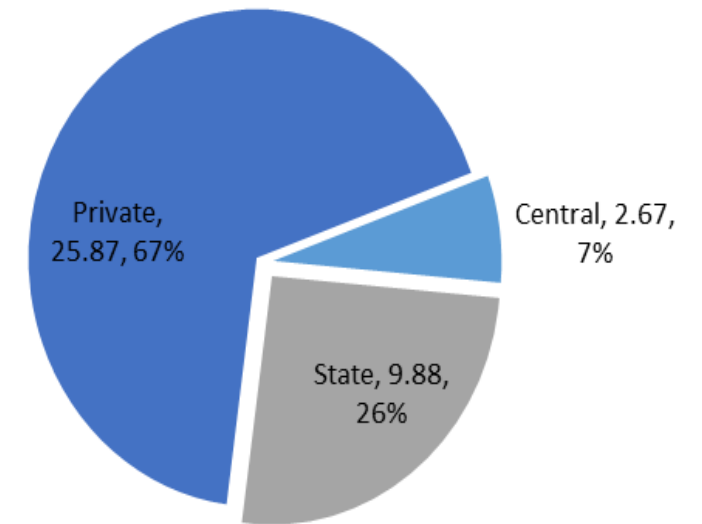
- Monthly coal allocation typically a little short of normative monthly requirement (@ 70% PLF)
- But actual coal supply much lower
  - ~15% short of allocation and 20% short of requirement on average
  - In some months, ~25% lower than allocation
- Partly explains low stock situation



# Impact on power generation

- According to CEA, no loss in power generation due to coal shortage
  - So, coal-based power generation was sufficient to meet demand
- Possibly due to procuring coal from other sources
  - ~38 MT coal imported for blending
  - ~56 MT coal purchased in special forward e-auction for power at a premium of ~45%
- Multiple regulatory orders allowing pass-through of such costs and short-term power purchase

Coal imports for blending Apr 17- Mar 19 (MT)



Conclusion: There is a shortage of linkage coal supply to power plants, which needs to be augmented

# Augmenting linkage coal supply



# Supply augmentation options

- Coal supply refers to coal that is delivered to power plants – i.e. not only should the coal be produced but also transported / evacuated to power plants
- Three ways of augmenting coal supply to power plants
  - Better coal evacuation without any change in coal production
  - Enhanced coal production with optimal evacuation
  - Procuring coal from other sources

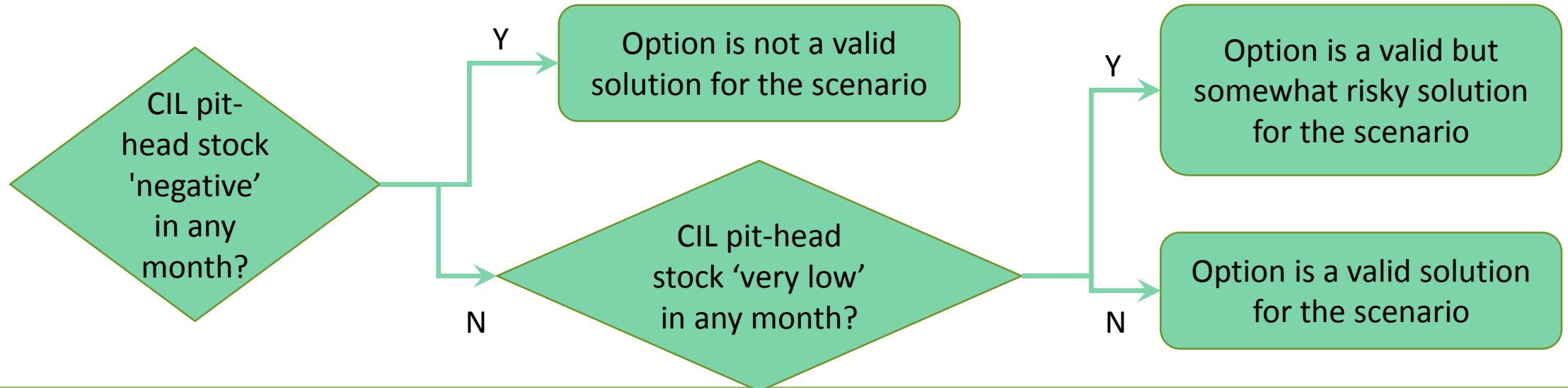
Could these options have helped to maintain reasonable coal stock at power plants over the last two years (FY 18 and FY 19)?

If so, they can provide a possible template for the future

# Analysis methodology

- Total coal demand = coal for power + coal for stock
- Coal demand for power estimated from coal-based electricity generated
- Two scenarios for coal stock at power plants
- For each option, what would be the CIL opening stock if estimated coal demand were met?

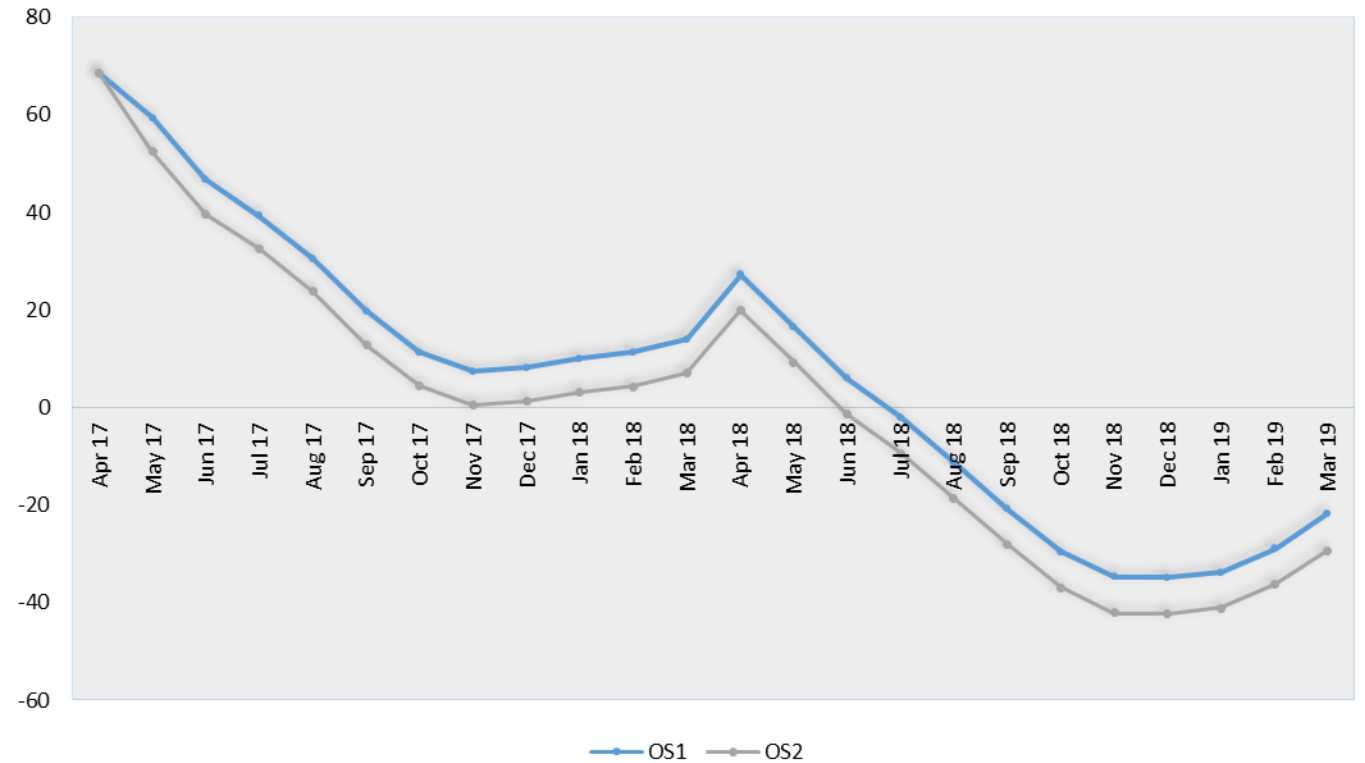
Scenario name	Scenario description
OS1	15 days stock at 70% PLF
OS2	20 days stock at 70% PLF



# Option 1: Better evacuation, unchanged production

- Would have helped in FY18
  - Could have maintained 15-day opening stock at power plants
- But would not have helped in FY19
  - Could not have maintained 15-day opening stock from July '18

CIL pit-head stock at current production levels (MT)

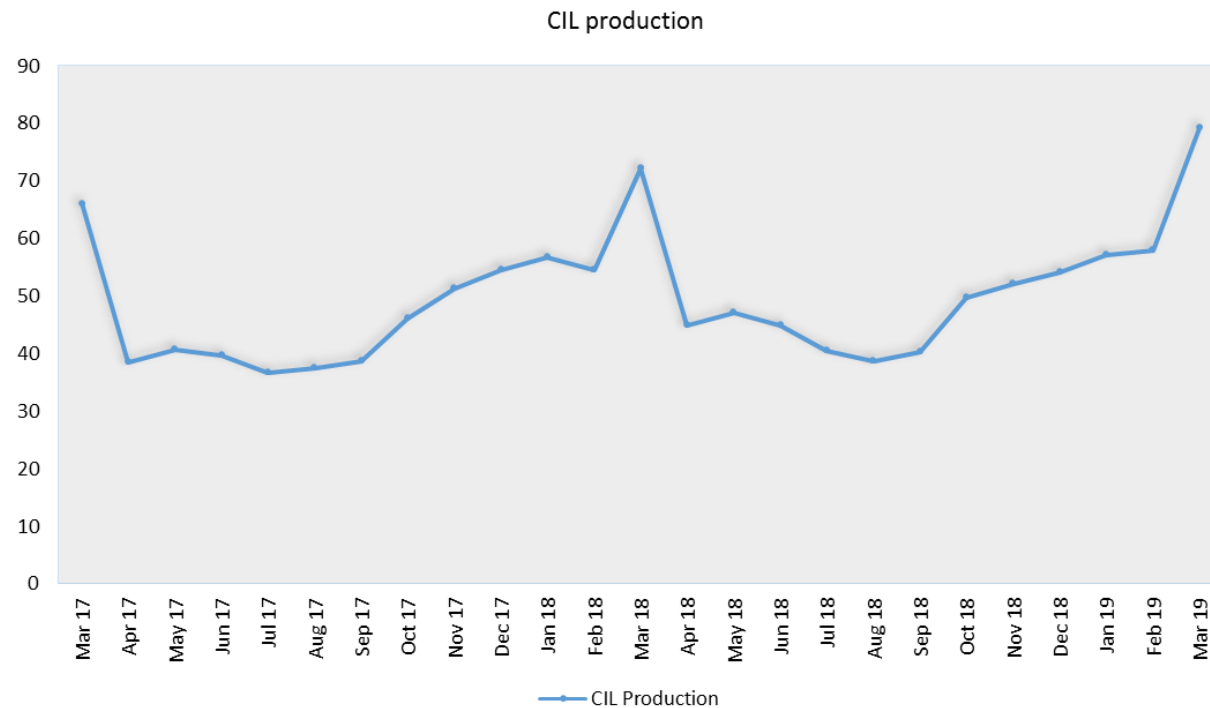


Improved evacuation alone can only mitigate the situation. It is necessary but not sufficient to address the coal shortage problem.

# Option 2: Enhanced production by CIL

- Considered two possible alternative production scenarios for CIL based on current production pattern

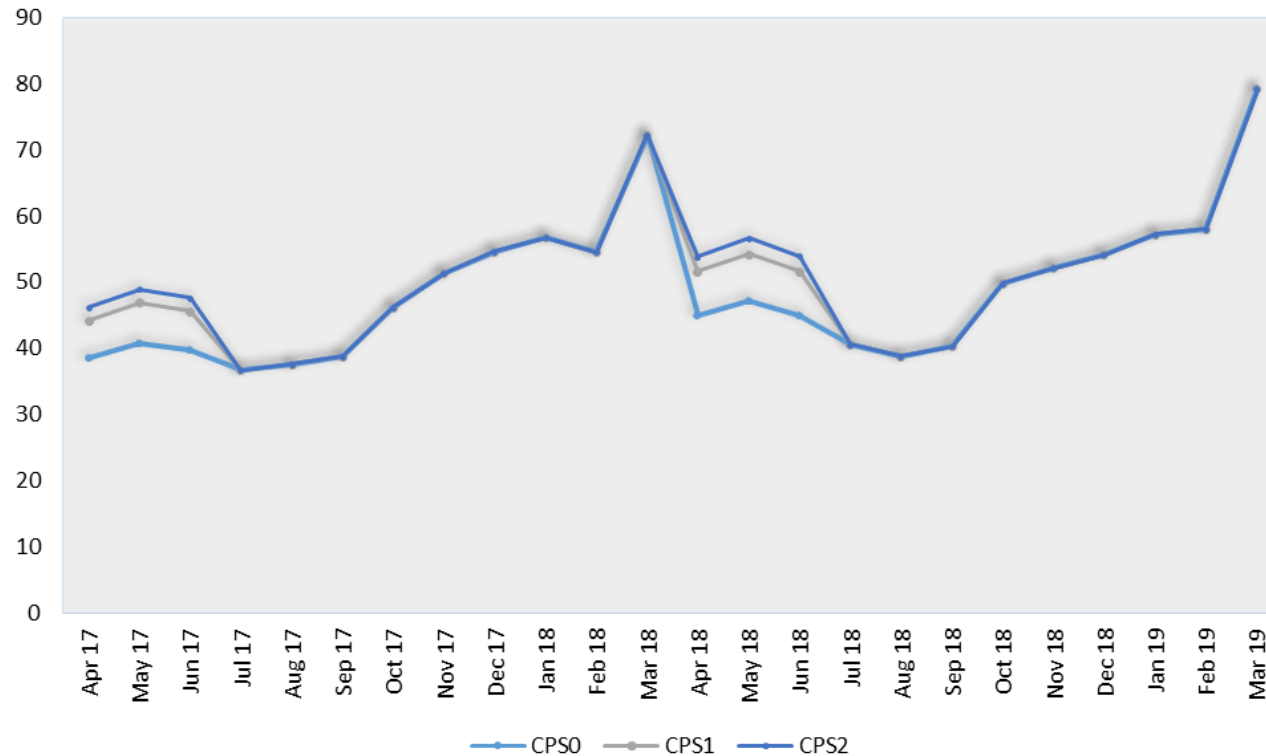
Scenario name	Scenario description
CPS1	Production scenario 1
CPS2	Production scenario 2



- Flat in summer months (Apr – Jun)
- Dip in monsoon (Jul – Aug)
- Gradual increase post monsoon
- Peaks in March

# Alternative production scenarios considered

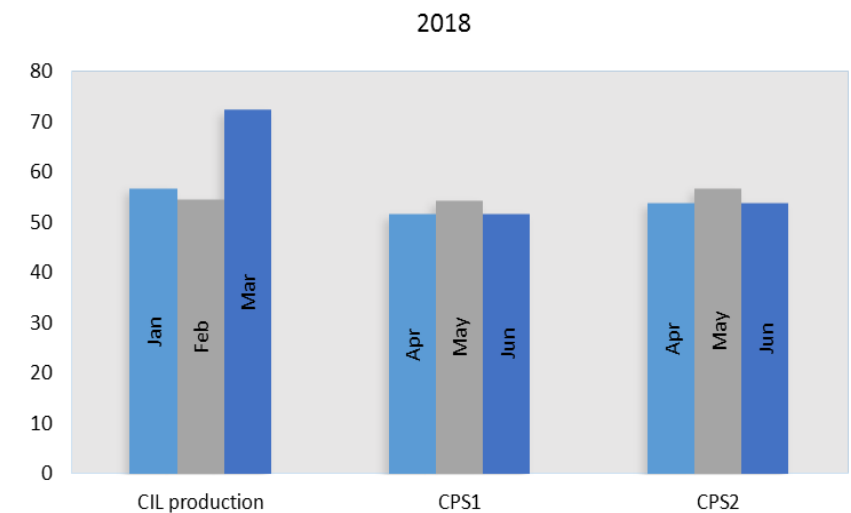
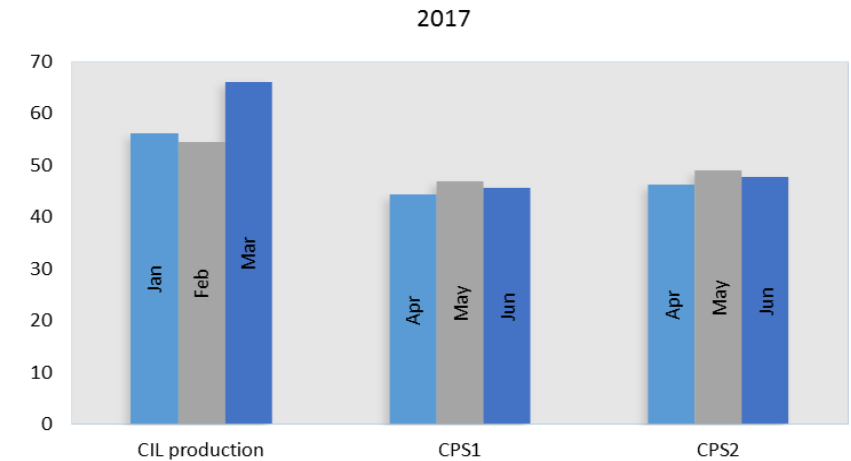
Enhanced CIL production scenarios



- No change in non-summer production (Jul – Mar)
- Greater production compared to current levels in Apr, May, June
  - CPS1: 15% greater
  - CPS2: 20% greater
- Total increase over FY18 and FY19
  - 3.3% (CPS1), 4.4% (CPS2)

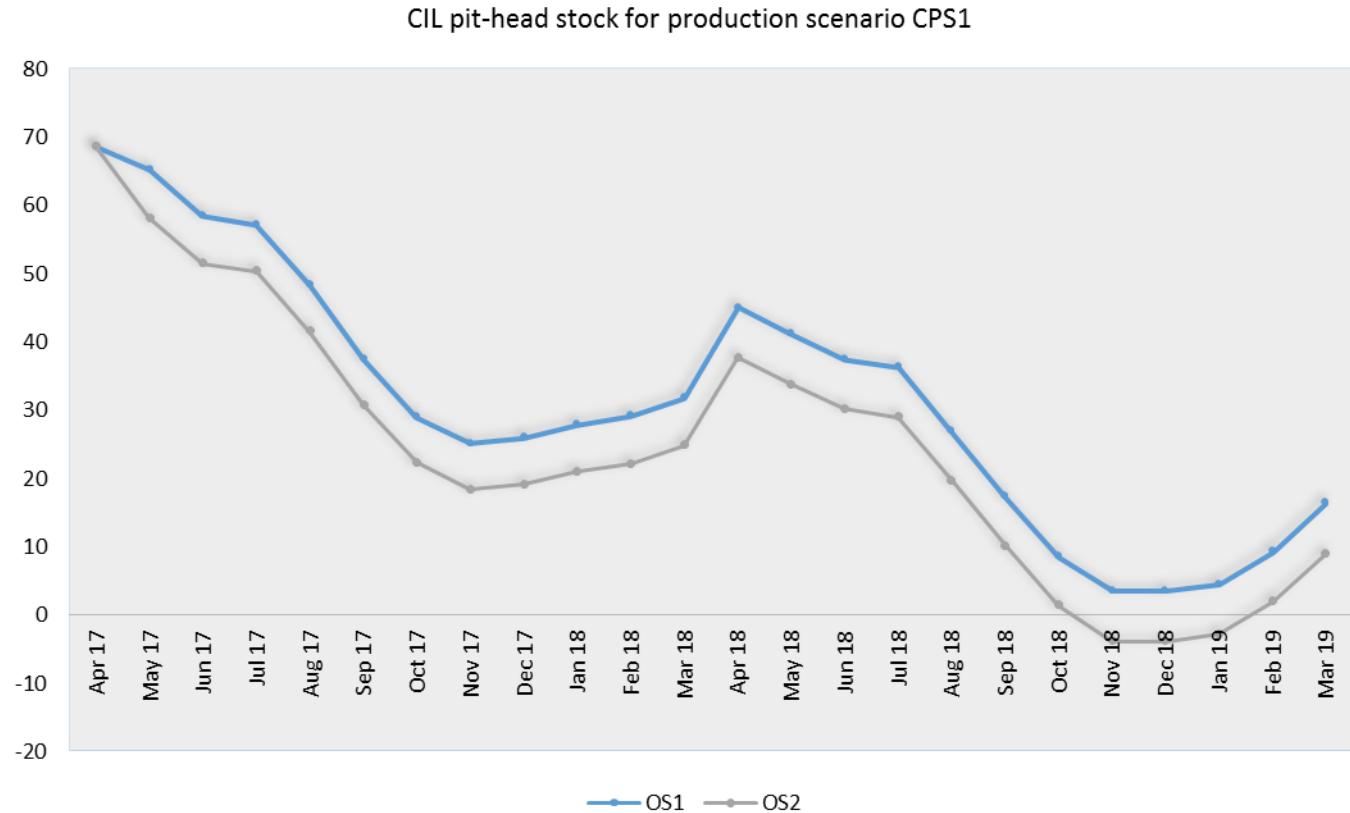
# Are the alternative scenarios feasible?

- Greater production suggested only in April, May, June
- Production in Jan, Feb, Mar of same year greater than what is suggested for Apr –Jun
- Therefore, alternative scenarios are technically feasible though operational questions may remain
- Pit-head coal stock level and safety not a concern
  - Have to evacuate coal to maintain desired stock at power plants
  - Pit-head stock never higher than Apr 2017 level



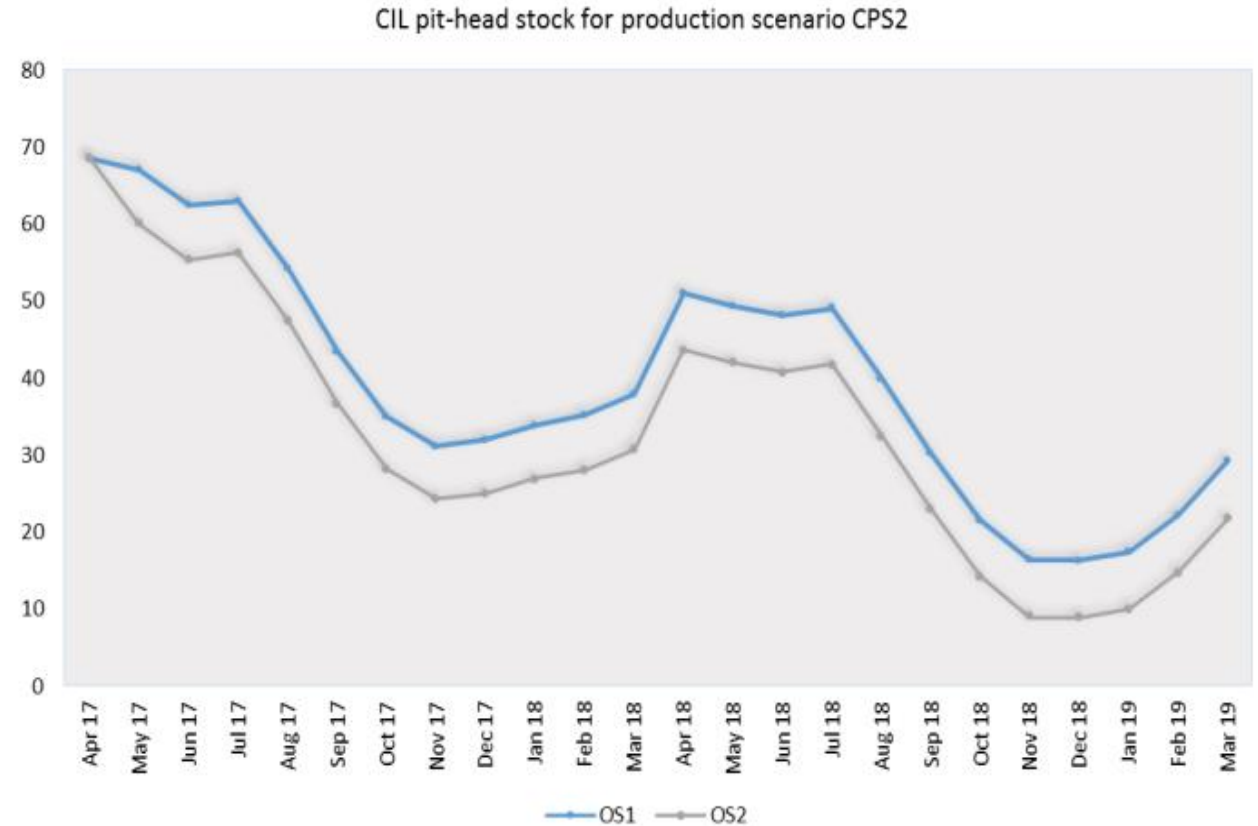
# CPS1: 15% greater production in Apr, May, June

- Would have met 15 day power plant opening stock requirement
- But could not have met 20 day power plant opening stock requirement



# CPS2: 20% greater production in Apr, May, June

- Could have met even 20 day power plant opening stock requirement
- 15 day opening stock requirement met comfortably



20% (15%) enhanced production in three summer months, accompanied by optimal evacuation, could have maintained 20 (15) day opening stock at power plants through the year.



# Option 3: Using E-auction coal for linkages

- CIL conducts four types of e-auctions:
  - Spot e-auction (all sectors), Special forward e-auction (power sector), Exclusive e-auction (non-power sector), Special spot e-auction (all sectors)
- Total quantity sold by e-auction over FY 18 and 19: ~172 MT
- Quantity sold through special forward e-auction for power: 56 MT
- Additional supply under CPS2 for 20 day stock over two years: 51 MT
- So, in principle, the coal sold through special forward e-auction for power is sufficient to meet coal shortage at power plants and maintain 20 day stock

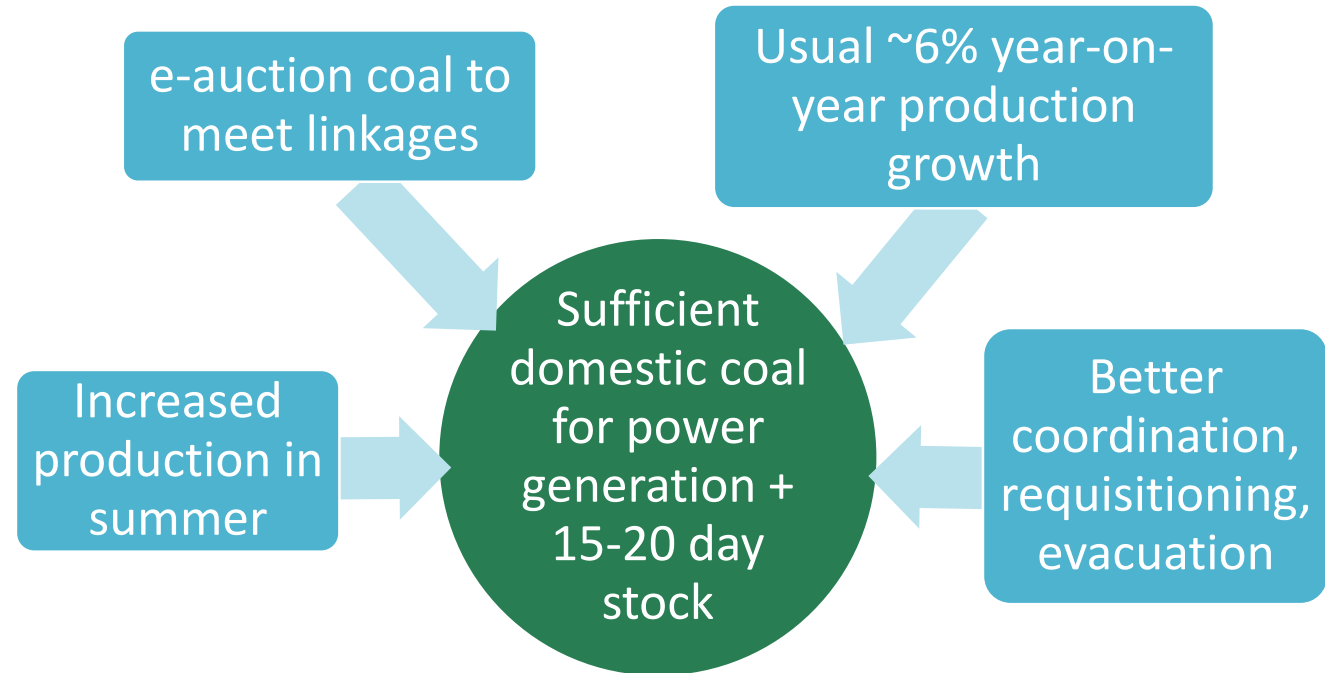
# Is this feasible?

- Will it affect e-auction coal availability to other sectors?
  - No, since proposal is only to use coal from special forward e-auction for power
- Will it affect CIL profitability?
  - CIL is contractually bound to supply linkage coal under its FSAs – shouldn't meeting that be the first priority?
  - Guidelines state that 10% of CIL production is to be sold in e-auctions. Figures for FY18 and FY19 show ~15% sold through e-auctions
  - Quantity proposed to be used to meet linkage requirement less than a third of coal sold through e-auctions

Using some or all of the coal currently sold through special forward e-auction for power to meet linkage requirements can help meet coal demand and stock requirements

# Conclusions

- Better evacuation will help but not enough
- Also requires increase in linkage coal supply
  - Enhanced production in summer months (feasible and safe)
  - Using coal sold under special forward e-auction for power
  - Some combination of the above



Prima facie, it appears that not only the annual coal shortage at power plants but also coal import for blending can be eliminated with careful planning and coordination.

# Thank you



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