



# Strategic Infrastructure Planning for Coal Industry Growth

Bowen Basin Coal Conference  
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## Strategic Infrastructure Planning



1. The elements of strategic planning for industry growth
2. The costs of strategic planning for growth or NOT
3. Case study – The Coal Infrastructure Strategic Plan
  - The situation in Queensland
  - Current planning activities
  - Approach and status
  - Next steps

## The situation



- In 2003 the coal industry was not prepared for the accelerating growth experienced since that time
  - Coal companies were focused on cost reduction
  - Infrastructure providers anticipated flat demand or slow growth
- Since 2003 the coal industry has been catching up
  - Coal miners have asked for >100Mtpa of new export capacity
  - All infrastructure providers are expanding their capacity
  - Regional communities are straining at the seams
- Having borne the pain of not having an integrated strategic plan...
  - What is now needed of a Coal Infrastructure Strategic Plan?
  - What is the cost of having one (or not)?
  - How is strategic planning proceeding & what needs to happen next?

## Infrastructure needed for coal industry growth



- **In order to grow, the industry needs:**
  - Coal transport – primarily railways and ports
  - Water supply – storage, groundwater, pipelines
  - Electricity supply – generation and distribution assets
  - Workforce – skilled labour available in the region
  - Regional transport – roads for construction / operating support
  - Regional infrastructure – dwellings, urban facilities & services
- **This infrastructure can be divided into:**
  - Enabling infrastructure without which growth cannot occur.
  - Supporting infrastructure which follows growth but is not fundamentally scarce, or beyond the reach of individual miners

## Developing an “industry strategic plan”



- **Understand the strategic context**
  - Global supply demand balance
  - Market, technological and global forces
  - Infrastructure constraints and opportunities
- **Plan for the range of scenarios for growth**
  - Any single forecast of production *will be wrong*
  - Identify the possible scenarios and prepare forecasts
  - Forecast the infrastructure needs
  - Identify the stages of development, lead times and triggers
- **Be prepared!**
  - Agree with stakeholders the level of preparedness required
  - Develop the plans to be ready for growth

## How prepared is “prepared”?



- **Being prepared means:**
  - Understanding the constraints to growth
  - Identifying the next steps for the enabling infrastructure
  - Preparing in advance to implement the next steps
- **The desired level of preparedness is a matter of state, community & industry judgment, ranging from:**
  1. Knowing what projects need to be developed
  2. Having projects approved ready for development
  3. Having projects designed ready for construction
  4. Having the next project actually implemented in advance

## The recent level of preparedness



- Since being collectively unprepared for rapid growth in 2003, there has been a massive response in Queensland:
  - Several major infrastructure projects are in progress, with some nearing completion
  - Several mine developments are in progress, but some mines are slowing production faced with infrastructure constraints
  - In the last three years, Government agencies and Infrastructure providers have commissioned or issued long term development and master plans
  - Some parties have also indulged in some public feuding about how long it is taking to respond to the market changes

## What does it cost to be prepared for growth?



- **Focus on coal transport infrastructure:**
  - ports & railways are growth enabling
  - expansion projects are major with long lead times
- In an uncertain world, being prepared means having the next expansion stage partly or fully “ready to go”
- In a notional future 200Mtpa export coal industry, the different levels of preparedness for growth have a notional cost:

Level of preparedness	Cost	c / t*	Deliverable
Knowing what to build	\$2M	0.05	Master plan
Having approval to build it	\$20M	0.5	Project EIS / BFS
Being ready to construct it	\$100M	2.5	Project detailed designs
Having built it in advance	\$2000M	50	40Mtpa of capacity

\* Recovered over 200Mtpa over 20 years undiscounted

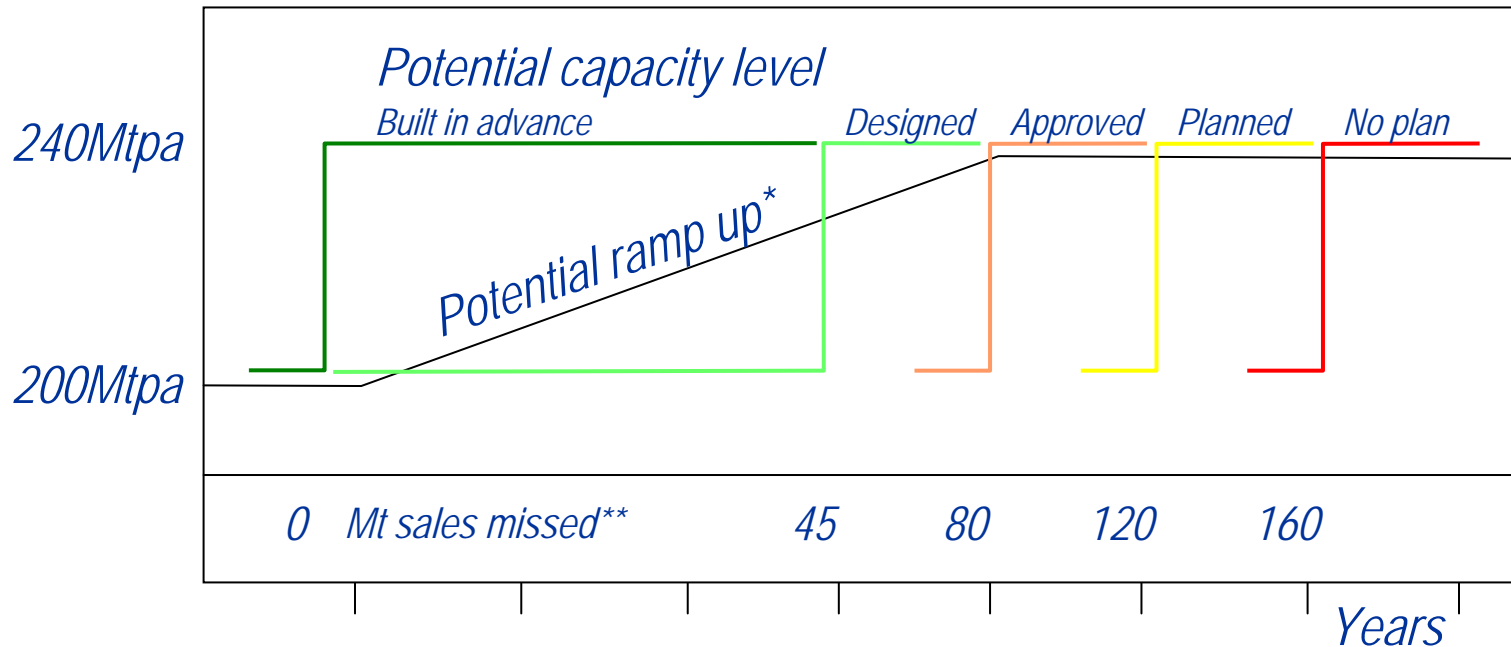
## How much does it cost to NOT be prepared?



- If growth accelerates as it did in 2003, the time it takes to build additional capacity depends on the level of prior preparedness
- Potential sales may be lost while deciding what to build, getting approval, designing it and constructing it
- The lead times are cumulative

Preparedness	Lead time	Total response time
Building major infrastructure	3 yrs	3 yrs
Designing infrastructure	1 yr	4 yrs
Getting approval to build	1 yr	5 yrs
Deciding what to build	1 yr	6 yrs

## The cost of industry not being prepared



\* Assuming miners fully prepared for 20% growth over 4 year ramp up

\*\* The area under the potential growth curve

*If the industry is not willing to pay the cost per tonne of being prepared, then it may pay in lost or delayed sales when rapid growth occurs*

## Why is strategic planning not in place?



- The cost of being “under prepared” for rapid growth can be much greater than the cost of being “over prepared” for slow growth
- Being prepared – having strategic plans in place – is challenging because the “industry” is not a single body; it comprises multiple and often competing interests :
  - miners / facility owners / facility operators / regulators / government agencies
  - participants who compete with each other and behave accordingly
- The long term planning process is made harder by:
  - the complexity of regulatory / approvals processes and
  - different planning horizons driven by political, project and market focus in different industry groups

## How does planning happen now?



- **Multiple parties actively planning their own futures:**
  - mining houses
  - industry associations (ECPE, QRC etc.)
  - government planning agencies (DOP, PIFU, DME)
  - public and private infrastructure providers
  - local government and regional associations
  - regional cooperative forums (Coal Chain Users)
- **The lesson of the last 5 years is that Government will have to provide strategic planning leadership for the industry**
  - The Department of Infrastructure and Planning has commissioned Connell Hatch to prepare a Coal Infrastructure Strategic Plan



## Dealing with different classes of infrastructure



- **Enabling infrastructure:** without which growth cannot occur. Typically major multi-user facilities with significant approval and regulatory requirements and / or inherent scarcity
- **Supporting infrastructure:** tends to follow growth but is not constrained by fundamental scarcity of resources or barriers to implementation
- **Macro infrastructure:** projects of significant size which can be identified and planned ahead of time
- **Micro infrastructure:** multiple smaller projects often involving local government; driven primarily by regional population growth

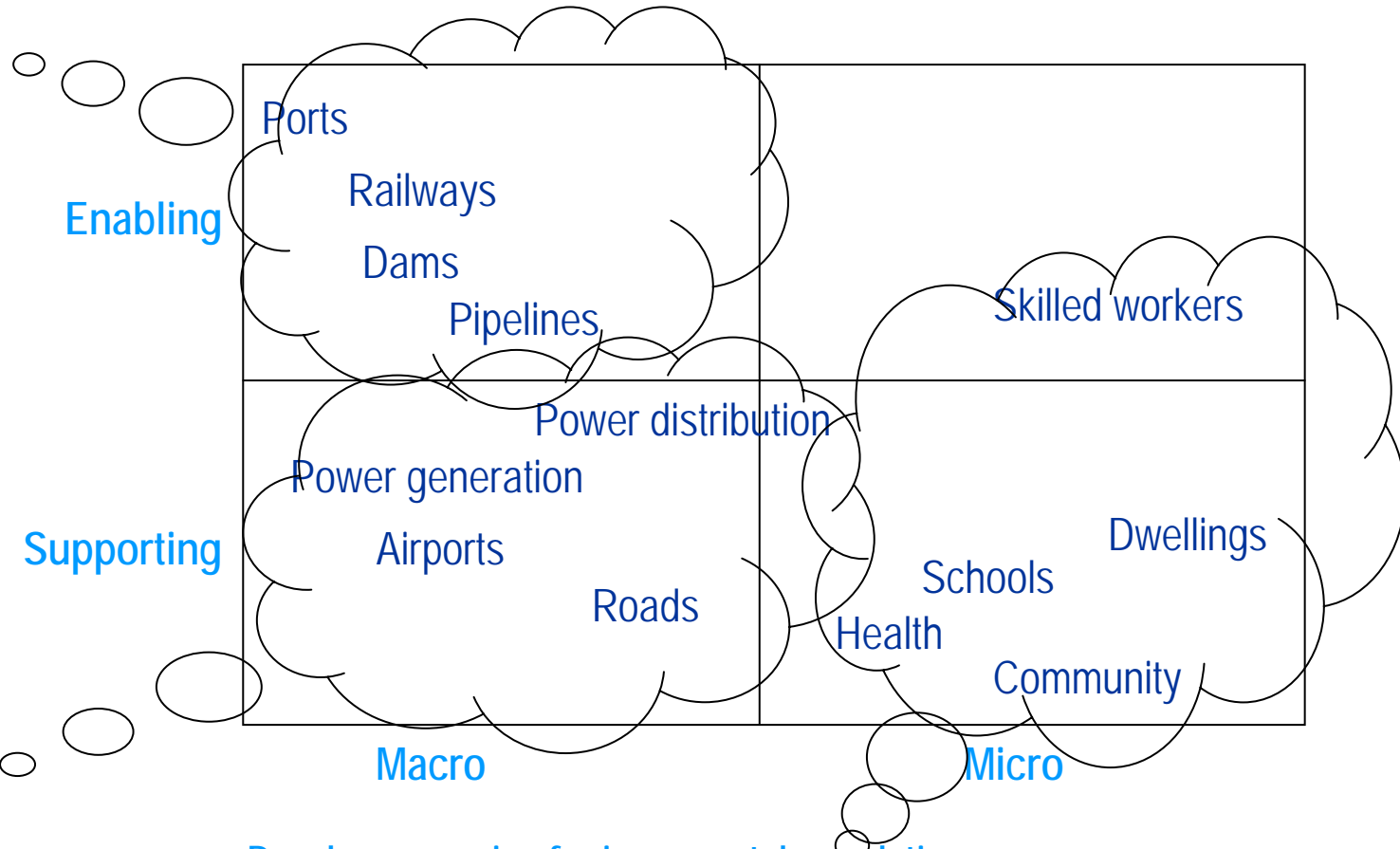
## Planning approach to classes of infrastructure

Identify projects, lead times and trigger volumes

Enabling

Supporting

Identify projects, and timing under different growth scenarios



Develop scenarios for incremental population impact as the fundamental driver of local government and agency planning

## Status of the Coal Infrastructure Strategic Plan



- Consultation with providers, miners, government 100%
- Coal production scenario definition 100%
- Infrastructure needs scenario development 100%
- Infrastructure planning by area: 80%
  - Baselines and gaps
  - Options and recommended projects
- Integrated development sequencing end October
- Consultation and reporting end November

## Production growth scenarios

- **Growth scenarios have been prepared**
  - DOI commissioned Barlow Jonker to prepare scenarios
  - Coal miners have also provided their views
  - Greenhouse gas reduction will have an impact, but there is a common view across miners, analysts and providers that the industry could be exporting >350Mtpa within 20 years
  - This will depend on the success of efforts to reduce greenhouse emissions associated with the coal industry
- **The shape and timing of growth curves is hard to predict**
  - Timing may be affected by as yet unforeseen economic, market & political events
  - Timing is less important in enabling infrastructure plans than the need always to *be prepared for the next step*

## Challenges – Population & Non resident workers



- The rise of camp based workforces makes it difficult to translate workforce growth into resident population growth / regional infrastructure needs
  - Most mining houses consulted have indicated a proportion of non-residential workers in existing and planned mines
- Nonetheless, significant further coal industry driven population growth is likely in many regional coal centres.
- Further consultation is required with government planning agencies on the future parameters for this trend.

## Challenges – Integrated coal transport planning



- Much has been made of the challenge of ramping up Queensland's coal railway and port infrastructures
- In 2003, "pre-boom":
  - coal export terminals usually prepared a long term Master plan
  - there was no integrated transport system capacity plan
- Since 2003, we have seen:
  - Long term master plans for all coal ports
  - Medium term master plans for QR networks
  - Formation of corridor specific planning forums
- What we need now is:
  - a coherent long term strategy for the integrated coal transport system
  - preparation of a Master Plan for integrated coal transport development

## Challenges – Coal Transport System



- The high forecast of export coal production to 2027 is > 350Mtpa
- This volume could be allocated to the 3 existing coal ports without unreasonable differential haul costs being imposed on miners
  - The inherent and master planned capacity of the 3 existing coal port precincts (Abbot Pt / Hay Pt / Gladstone) is over 400Mtpa
  - The cost and approval challenges of developing a 4<sup>th</sup> export port precinct would be very significant and there are few suitable sites
  - The main trunk railway corridors serving these ports are capable of capacity expansion to match the port capacity
  - The system needs flexibility of rail interconnection of trunk corridors (missing link projects) to allow coal routing to match port capacity
- The commercial structure of the coal transport industry may need to move from its corridor centric model toward an integrated model that supports routing flexibility

## Next steps



- **This Coal Infrastructure Strategic Plan will deliver:**
  - A 20 year, volume linked sequence of projects for the enabling infrastructure required to develop the coal industry
  - Forecasts of the population drivers of supporting infrastructure development, for different scenarios for coal exports growth
  - A computer model that links coal volumes to infrastructure needs, to enable ongoing review and development of the Strategic Plan
- **A Strategic Plan is necessarily a high level view of needs**
  - The next step is to develop integrated Master Plans for enabling infrastructure – Coal Transport and Water Supply – with commitment from infrastructure providers to the scope, cost and lead times of the infrastructure required

# Questions