

BP PTA +

Advantaged Proven Technology

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BP PTA

Advantaged Proven Technology

- BP PTA technology
 - Lowest total cost of ownership
 - Commercially proven
 - Distinctive environmental performance
- BP /TechnipFMC Alliance



BP PTA

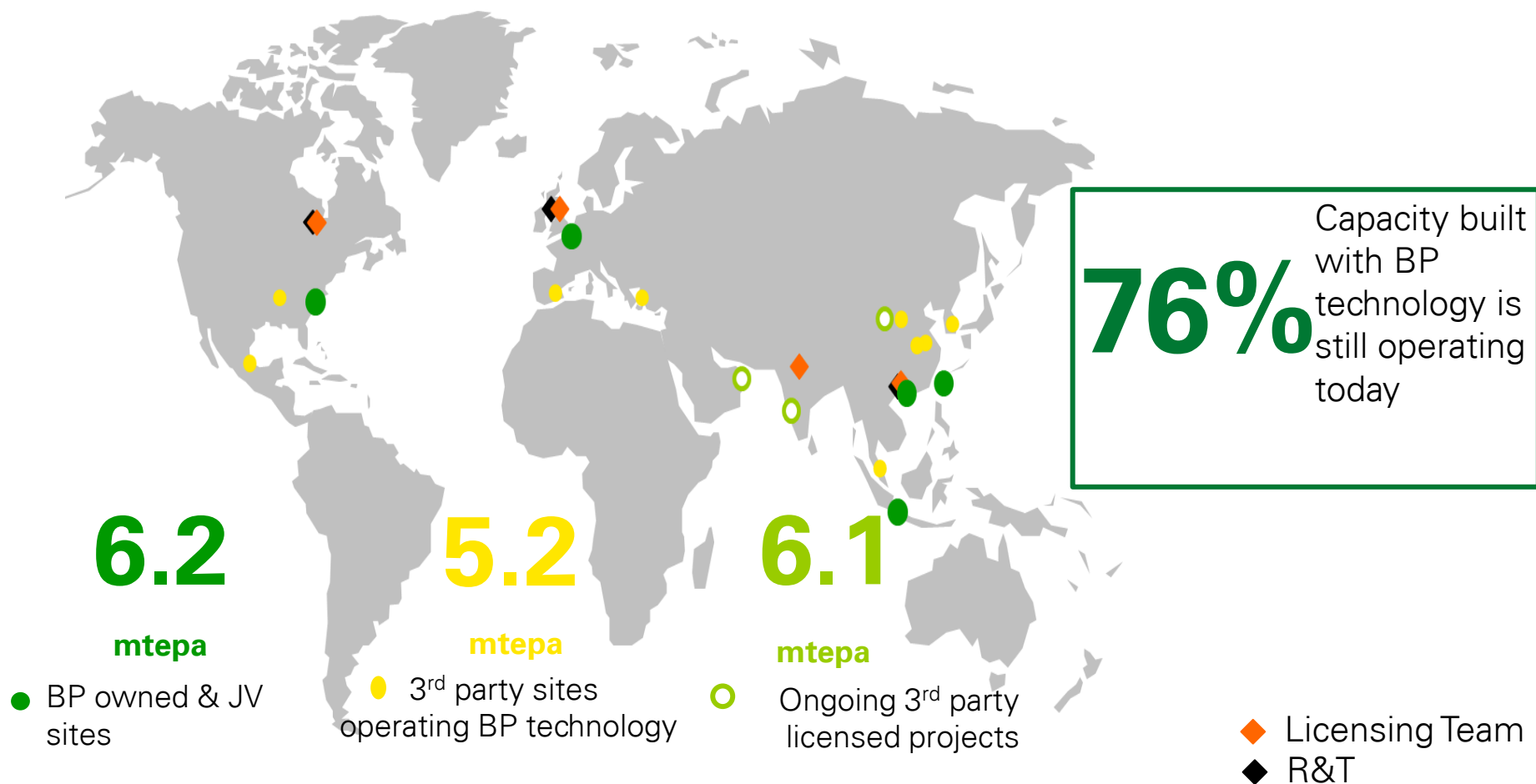




BP PTA

Global and Established Technology

BP has been a leader in PTA technology, manufacturing excellence, and licensing since becoming the first commercial producer of PTA 50 years ago



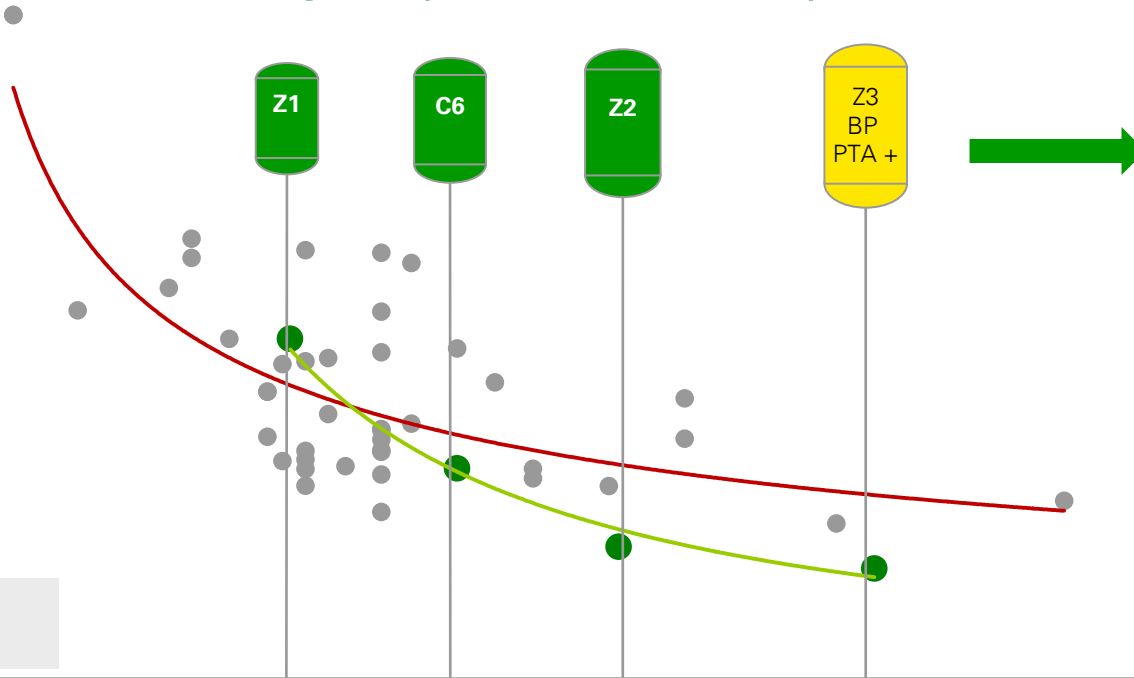
*Data Source: IHS World Analysis Report: PTA & DMT



BP PTA

Driving Capital Efficiency

Normalized EPC Cost per Capacity (USD/mtepa)



● Competitor PTA technology

● BP's evolving PTA technology

Scale advantage

Reduced equipment count by 160 pieces (30%)

Improved plot plan efficiency (capacity/m²) by 400%

Local equipment sourcing

Capacity



15% local equipment

60% local equipment

85% local equipment

\$60 million savings over our closest competitor



BP PTA

A story of Continuous Improvement

25% lower capital
than conventional technology

44% lower variable costs
than Zhuhai 1

33% lower variable costs
than Zhuhai 2

2003

First generation of breakout technology focused on reducing capital costs

- 40% fewer pieces of equipment
- 40% smaller plot plan
- 75% less process wastewater
- 40% less solid waste

Zhuhai 1

Some parts of technology implemented as retrofits to existing PTA assets

500 ktpa

2008

Lowest capital and variable cost single train PTA plant in the world

- Additional plot plan reduction
- 50% reduction in GHG
- Over 50% reduction in fuel
- Net generator of electricity

Zhuhai 2

Technology leverages economies of scale, process integration, and allows for more local sourcing of equipment

900 to 1100 ktpa

2015

Lowest cost producer in the world

- 100% Operating rates
- 97% Reliability post TAR
- On-spec within 24 hrs of startup

Zhuhai 3

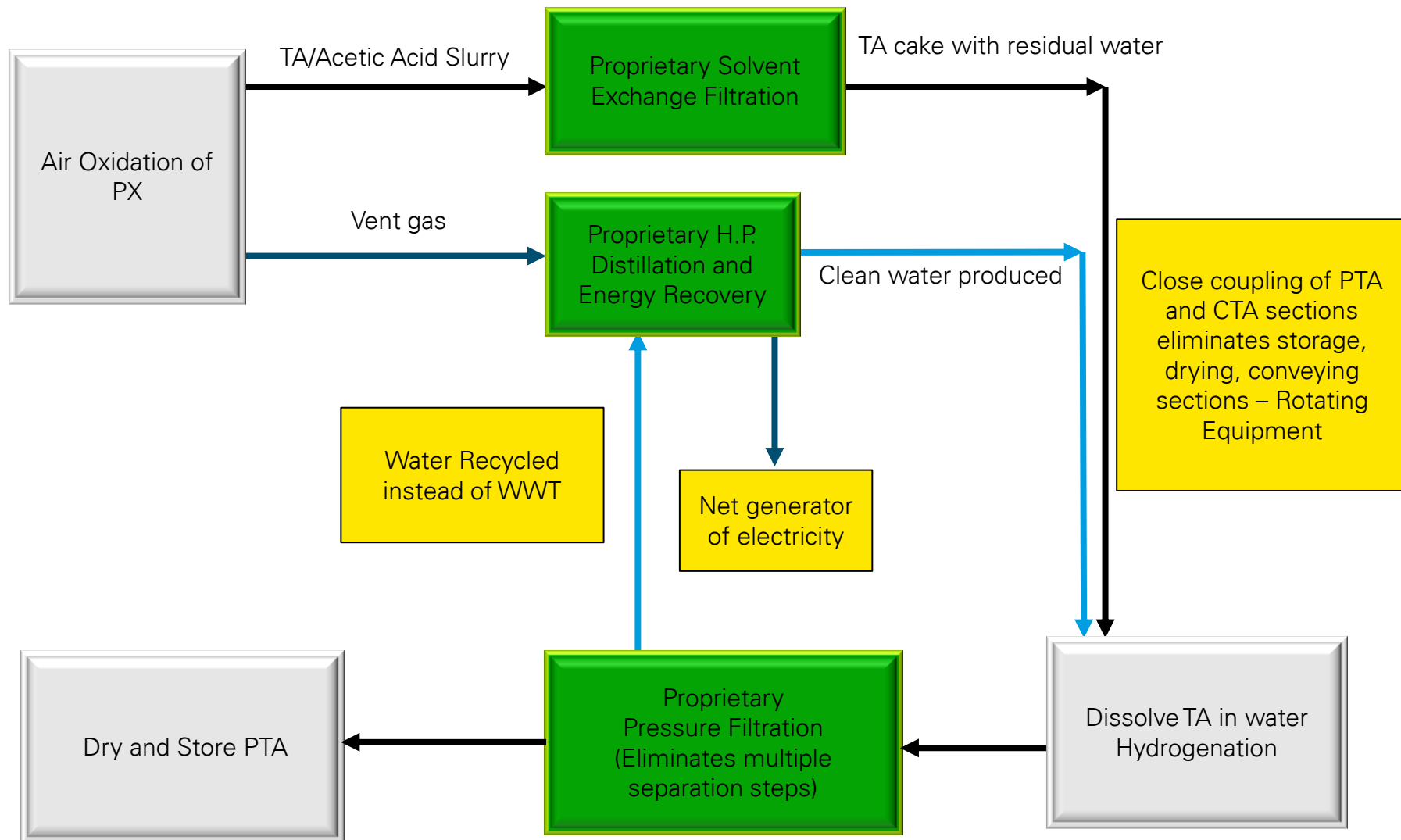
Variable cost is the lowest in the world and still dropping with ongoing optimization

1,250 ktpa



BP PTA

Deployed at Zhuhai 2 and Zhuhai 3





BP PTA Market Leader in Environmental Performance

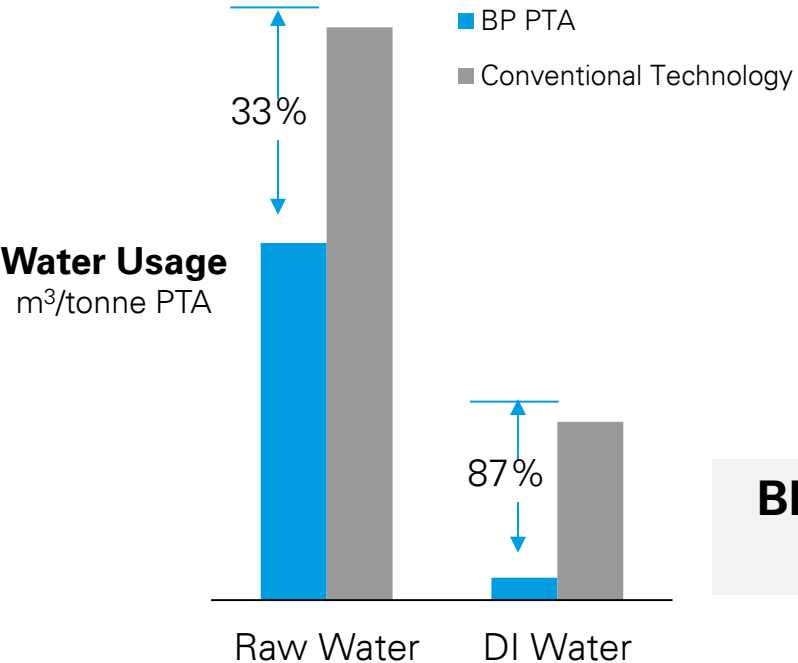
⚡ Recovers enough heat to power the entire site and sell electricity to the grid

95% Lower solid waste disposal*

75% Lower water discharge*

65% Lower GHG emissions*

Distinctive Environmental Performance



BP Zhuhai was the only PTA plant to receive China's "Energy Efficiency Advanced Enterprise" award In 2016

BP PTA produces the most cost efficient PTA in the world using the cleanest technology



bp PTA^{air}™

The sustainable
future of PTA

29% lower carbon PTA

Carbon neutral PTA

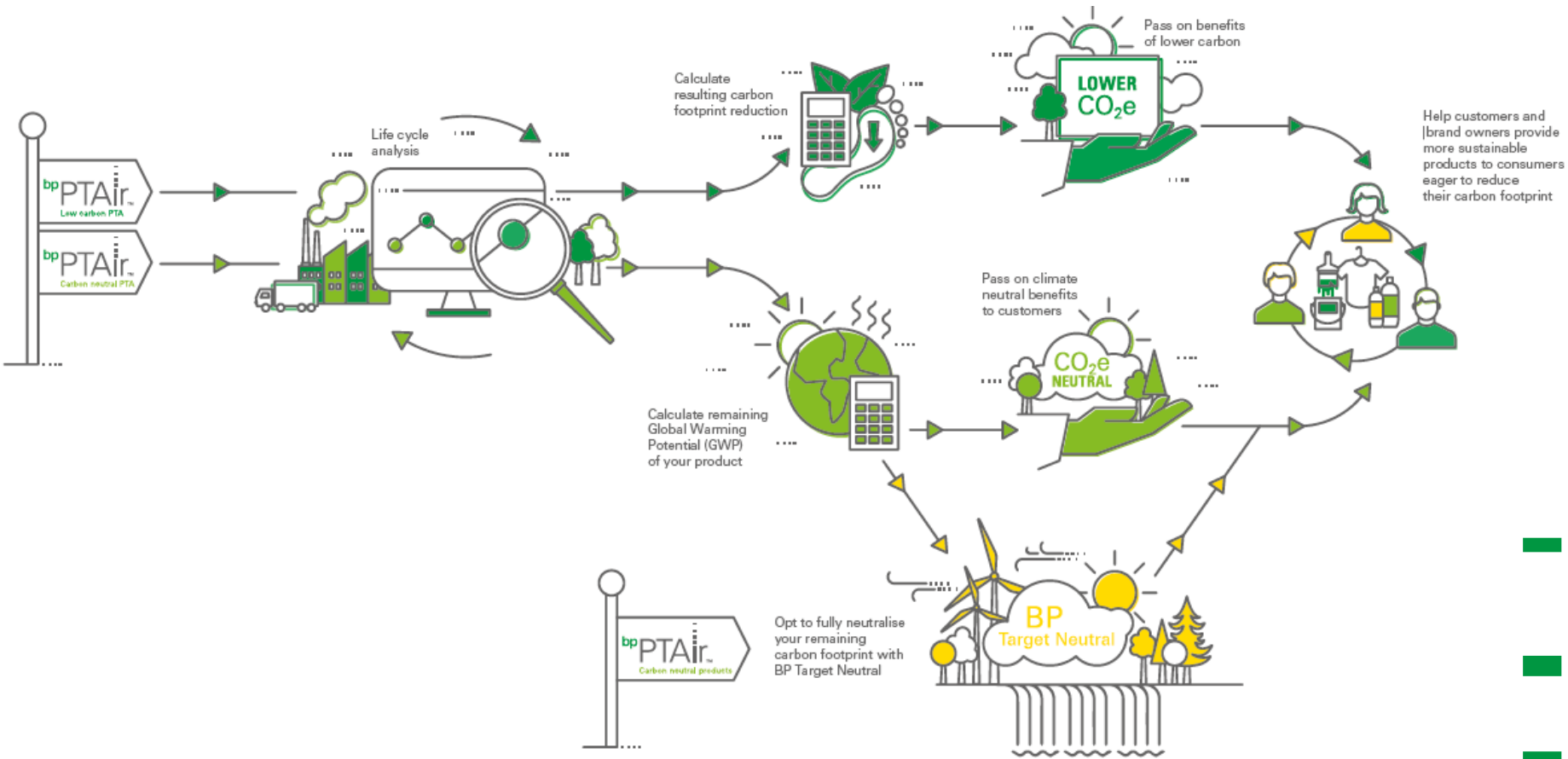
Carbon neutral products

NOW !





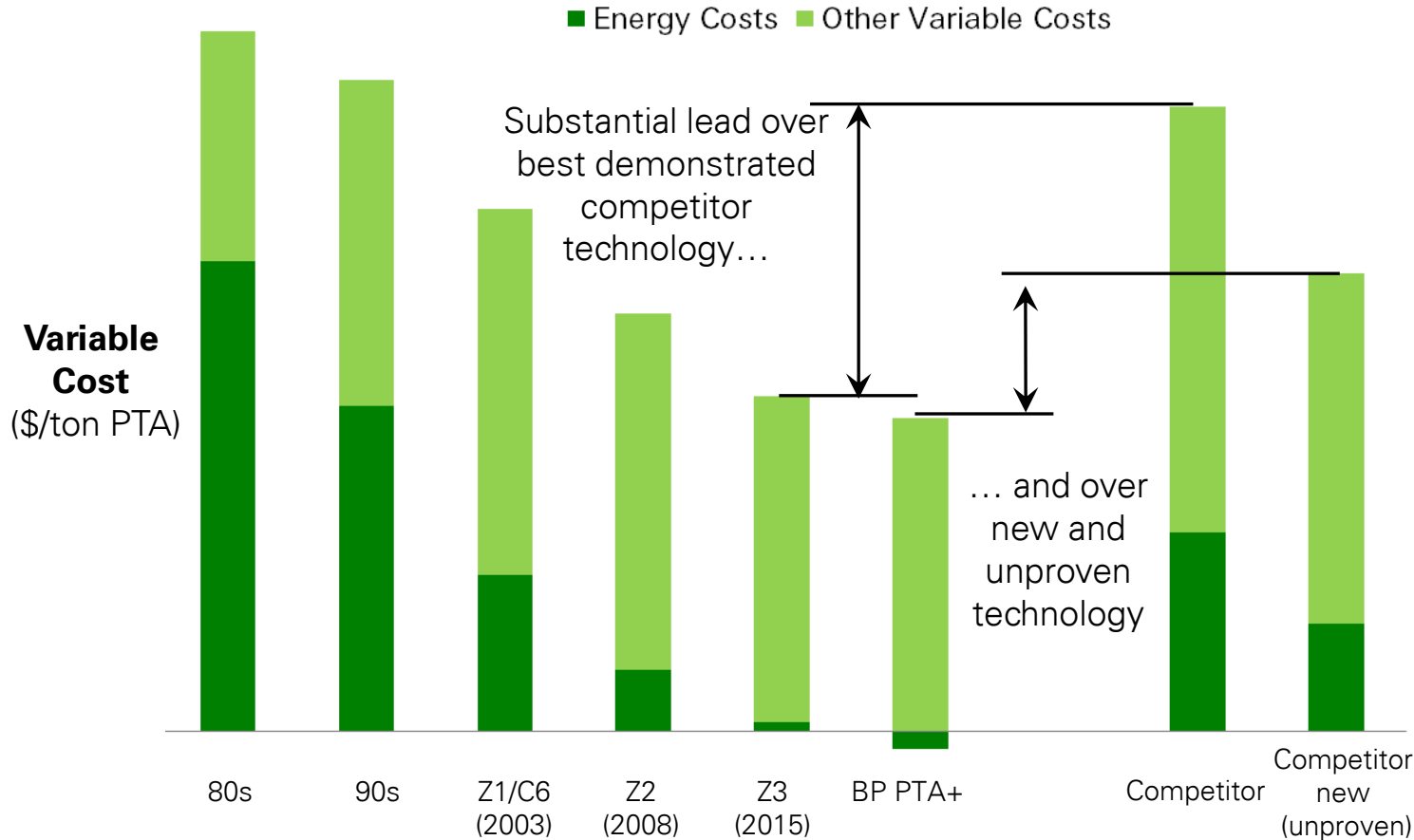
How to implement PTAir





BP PTA

A Demonstrated Technology that Works



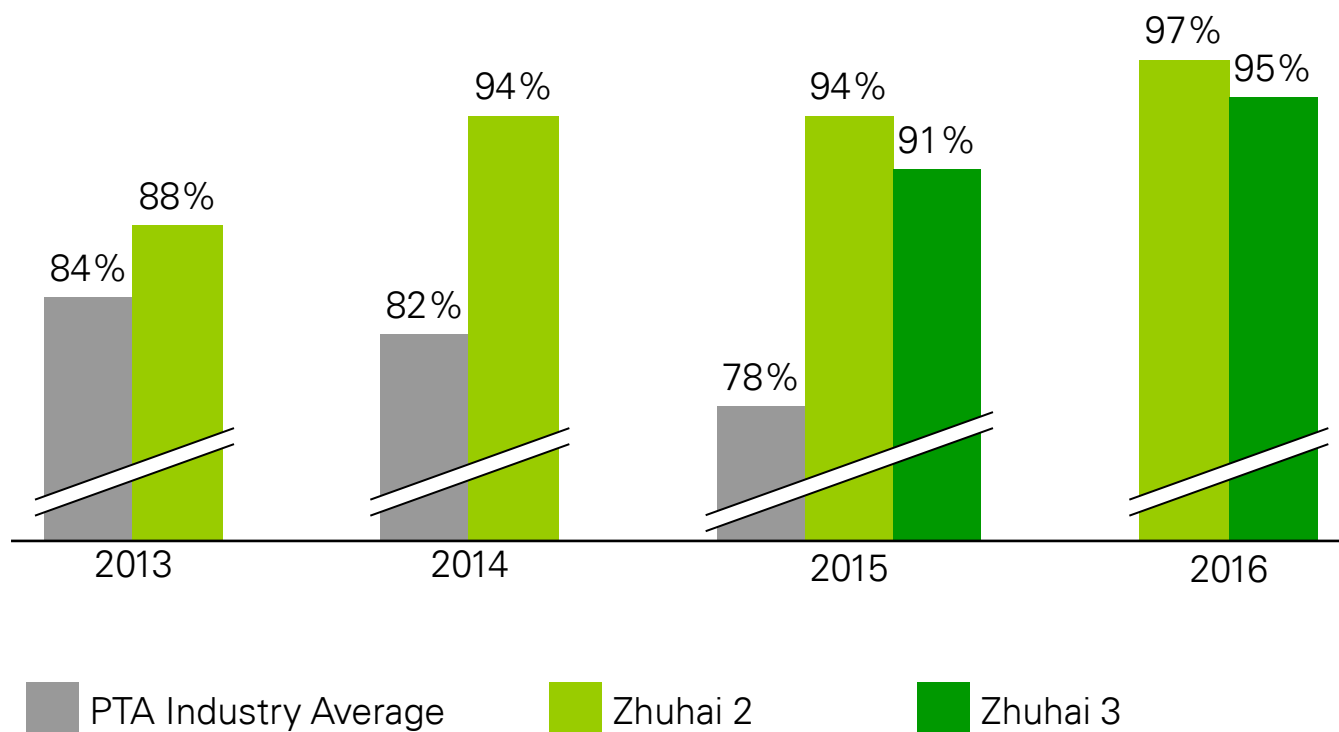
Based on BP experience and industry data, any new technology will have a \$15/ton higher VC than expected for at least 3 years until new technology issues are resolved.

This is technology that delivers in practice, not just on paper



BP PTA Leading Technology for all Commercial Environments

- Zhuhai 2 has been consistently operating safely at >95% reliability
- Utilization at Zhuhai is > 95% due to low costs whilst most of China is at ~ 80% through downturn



Our technology is proven worldwide in plants that produce the most cost efficient PTA available on time, on budget and on spec, reliably and safely



BP and TechnipFMC

An exclusive strategic alliance

Delivering projects on time and budget, minimizing execution risk

17

years

The BP-TechnipFMC alliance began in 1999

8

mtepa

PTA capacity engineered by TechnipFMC based on BP technology

20

Fully owned, JV, and licensed PTA projects completed through this alliance

- The collaboration spans from technology development to project life cycle optimization
- TechnipFMC is a key element of BP's PTA business strategy:
 - State of art methodologies
 - Joint development of the evolving technological suite (up to PTA+)
 - Ready to go integrated PTA community



TechnipFMC is a world leader in the design of PTA units with unique experience in BP technology



TechnipFMC

Providing excellence to BP licensing projects

Strong local presence

- Historical footprint in India with extensive references within all categories (state owned, private) of local clients and specific tailored synergy in PTA among the Rome and local offices

Compressed schedule

- High level of standardization of the ISBL process and LLIs design
- Extensive re-use of engineering

Actual material quantities and costs

- Apply Value Improving Practices methodology to support clients from project inception (both ISBL and OSBL)

Market expertise

- Local and offshore, capable of responding to specific PTA-tailored market inquiries
- Mitigates the risks of core/ LLIs materials management as well as of “out of the comfort zone” procurement campaigns

Risk management

- Built from both an extensive in-house database of recent PTA projects and TechnipFMC’s extensive project execution capability



BP PTA

No one offers more

Lowest Total Cost of Ownership

Commercially Proven

Distinctive Environmental Performance

Manufacturing Support

- Technical Service, Training
- Critical spare parts and catalyst beds
- Access to continuous improvement
- Logistics support/advice
- Second operators from BP assets
- TAR and safety support
- Optimization services
- Global Manufacturing Excellence group

Marketing Support

- Assistance with project feasibility studies
- Pre-Marketing
- Customer Support (PET)
- Supply/offtake agreement opportunities

Tailored Offer

- Capacity flexibility and potential retrofits
- Joint offers (pX/PTA, PTA/PET)
- PTAir – low carbon & carbon neutral PTA, carbon neutral products

BP has won four PTA licenses since offering its demonstrated technology in 2012

BP PTA

Advantaged Proven Technology

