

Maximising the Benefits of Residue Upgrading: How do I choose what's best for me?



Coking and Gasification 2009

So, we've seen:

- **The potential options**
- **How they fit together**
- **How can we add other processes such as SDA, CFB and IGCC to enhance the scheme**

But ...

How do we choose the very best and the most suitable option?



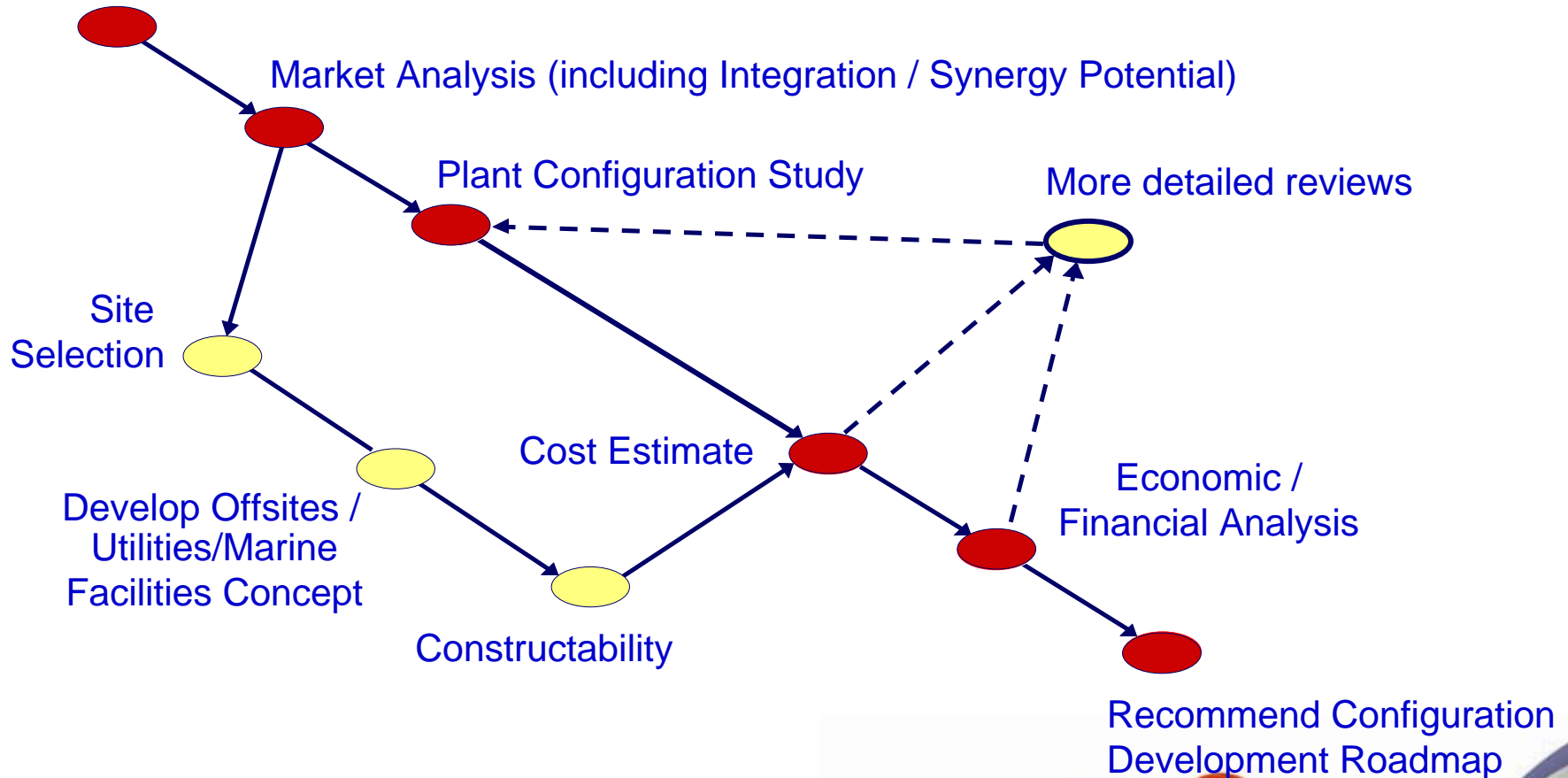
Refinery investment: making the right decision

- **There are many processing options available to refiners**
- **The right choice can depend on:**
 - Client' business strategies / objectives
 - Location, local infrastructure, existing facilities
 - Domestic and export market demand
 - Product specification and environmental legislation
 - Budgets / funding
 - Crude availability / price
 - The refiner's other refining assets
- **Making the right decision is of strategic importance for our clients**

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The Foster Wheeler Approach

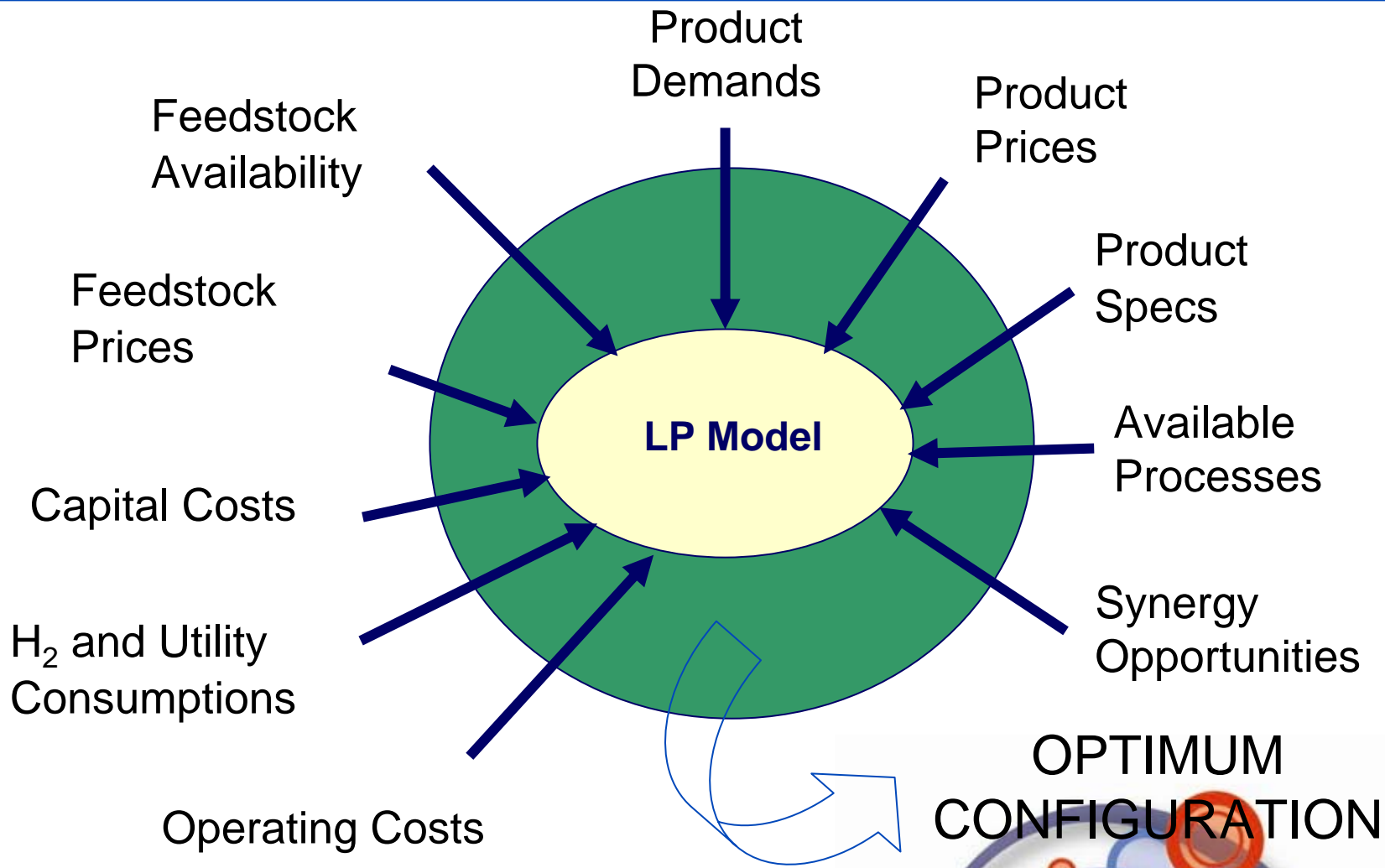
Agree Objectives



“Real project execution experience that adds value to your business”

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The Foster Wheeler LP Model



Available Process Unit Models

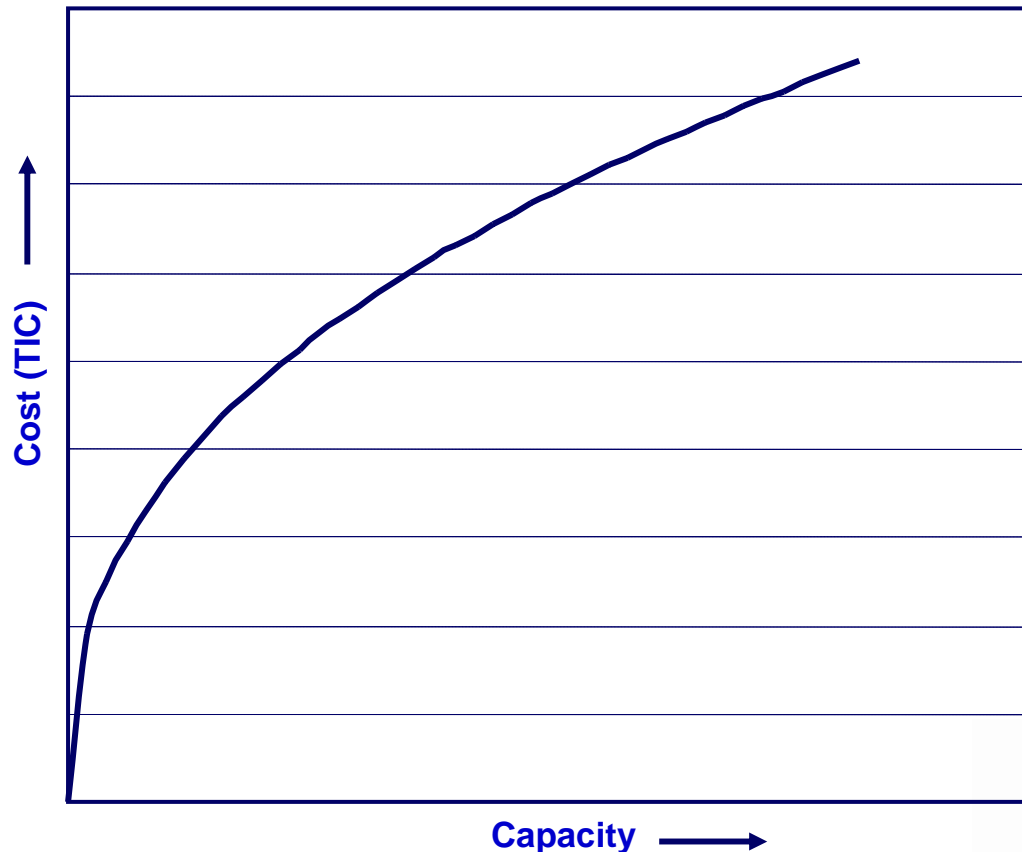


- **All major processing unit options can be considered within the LP model**
- **The refinery processes are modelled to reflect**
 - Product yields and qualities
 - Hydrogen and Utility consumptions
 - Operating costs
- **Based on:**
 - Feed quality
 - Operating modes / severity

Extensive in-house data provides basic data with more advanced information from licensors when available

Process Capital Costs

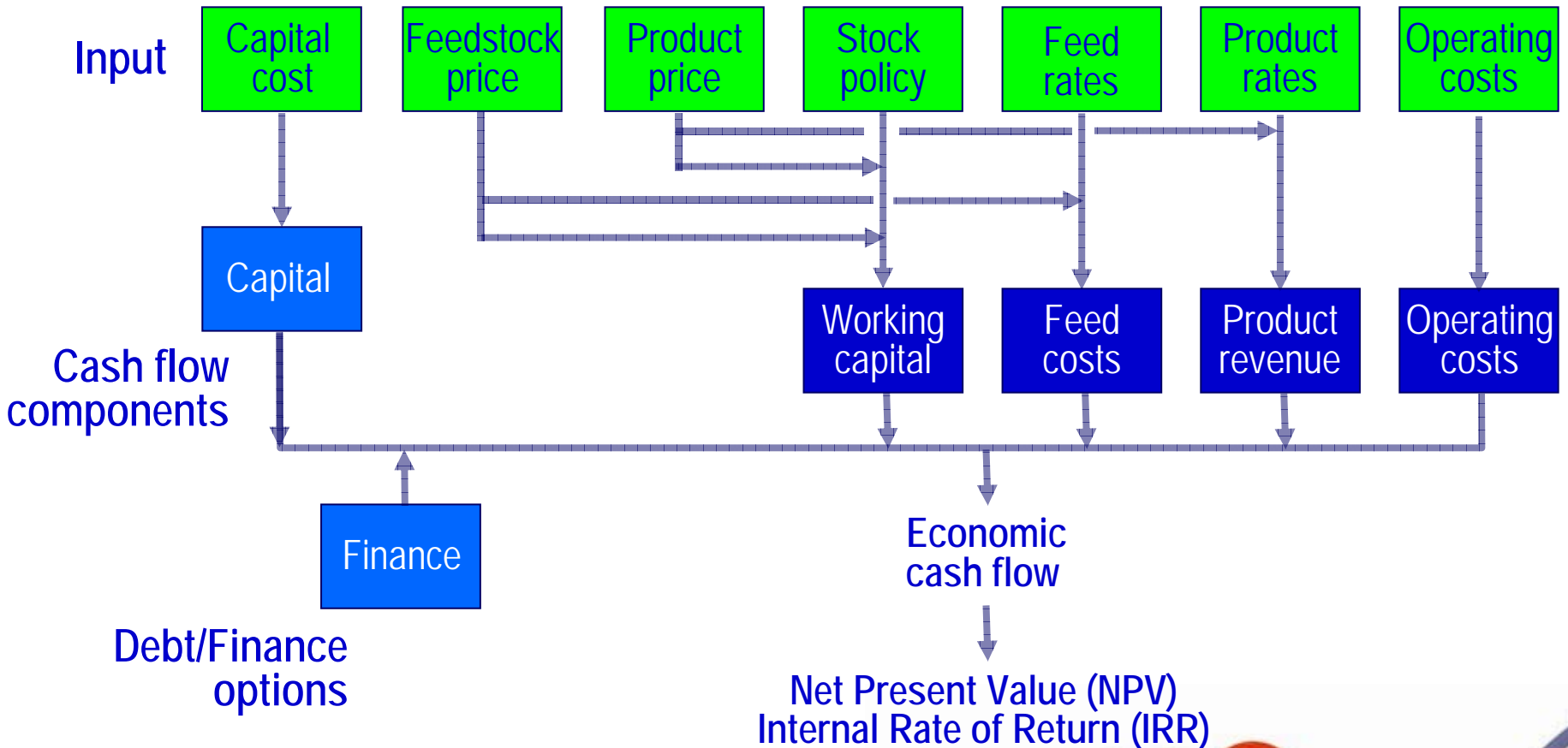
Typical Process Unit Cost Curve



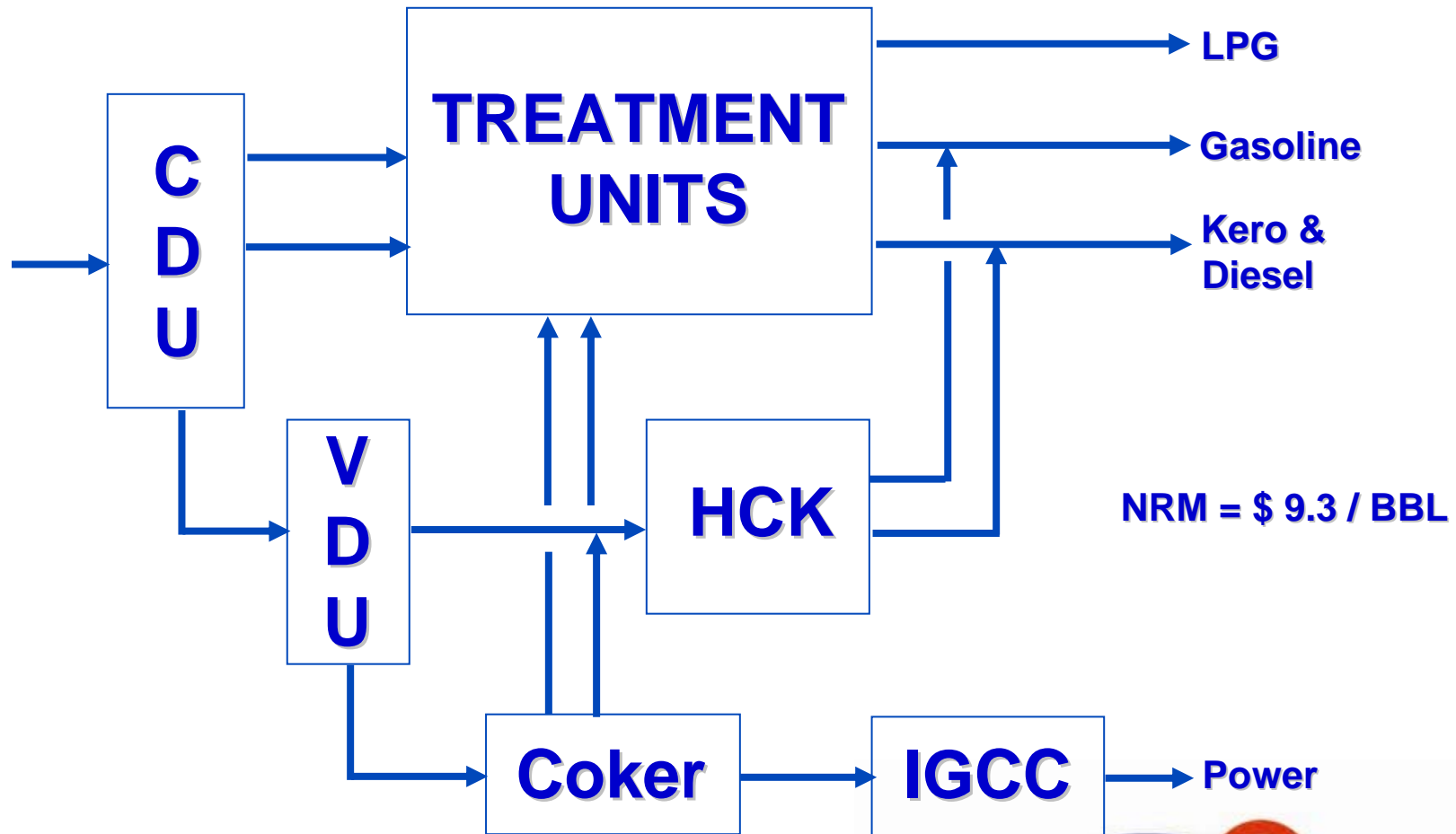
- Process unit costs developed from in-house capital cost database (USGC basis), adjusted for a location factor as appropriate.
- Offsites/utilities costs developed based on conceptual designs and equipment lists for major equipment.
- Other costs such as common facilities, infrastructure, indirect costs, engineering costs etc are factored from the main equipment costs based on the plant layouts.

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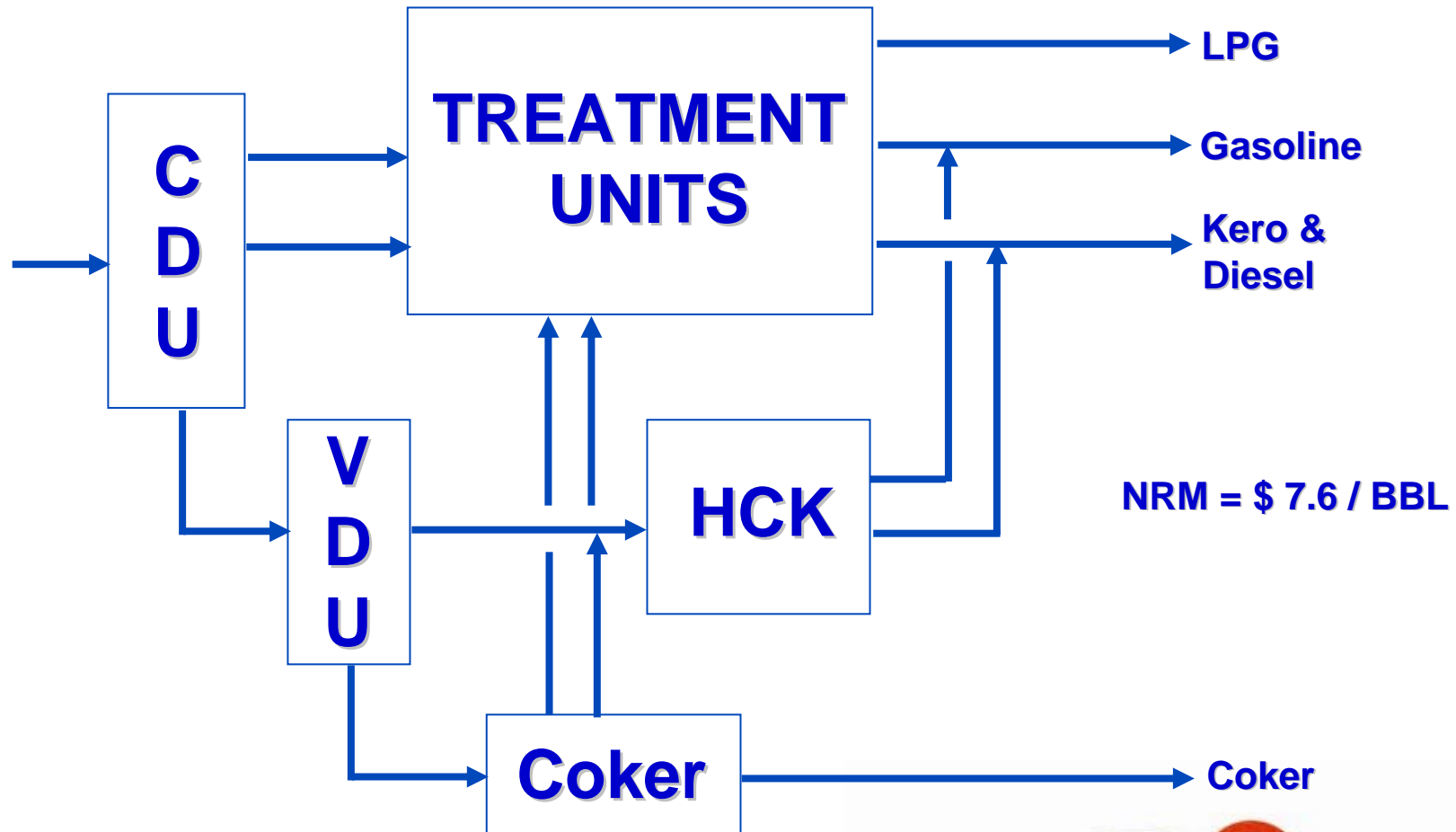
Optimising Investment



Case Study: Heavy Crude Upgrading Refinery – No CAPEX Limit



Case Study: Heavy Crude Upgrading Refinery – With CAPEX Limit



- **Clients choose Foster Wheeler to help them plan and shape their refinery investments. Why?**
 - **Our highly regarded refining experts deliver high quality studies and front-end designs**
 - **Our refining knowledge is deep and wide, covering all technologies and types of process unit**
 - **We handle large complex projects, as well as revamps /single units**
 - **Our work is based on real EPC experience, cost data, local knowledge, and are practical and constructable – unlike many consultants**
 - **Our studies and FEEDs give clients a robust basis to take their planned projects through their gate reviews for investment approval:**
 - **Phased investment plans to align with clients' funding constraints**
 - **Amending the refinery configuration to take account of changed objectives**
 - **Innovation and creativity to “engineer out” additional costs.**

Summary

- **Investment planning is essential to optimise the project and confirm feasibility ahead of any significant expenditure**
- **A short list of technically feasible options should be generated with economic evaluation of the most promising**
- **Investment planning can be iterative, but it's better to get the conceptual design right before risking substantial recycle of effort**

Bringing real, practical EPC experience to conceptual investment planning



Thank You

