Platt’s European Refining Market Conference
“Diminishing Thirst for Gasoline” – US refinery implications
Brussels, Sept 2011
In 2010, global demand recovered strongly, wiping out the losses of 2008 and 2009.

Aside from 2004, 2010 showed the strongest demand growth for 20 years.

Source: Wood Mackenzie’s Product Markets Service
US vehicle usage declined in response to high pump prices and weak economic environment……

Source: US DOT, EIA, WM
US gasoline demand has hence fallen, with imports from both NWE and Mediterranean reduced.....
…..reflecting changes in competitive position, with European’s impacted by diesel weakness….
In spite of the weak economy, most US refineries achieved healthy cash margins in 2010...

For 2010, Canadian refineries had the highest NCM in region owing to significant crude discounts and insulated product markets,

Looking forward, structural change in WTI-Brent relationship expected to boost U.S. refining margins especially in PADD II-IV region, global strength in distillate demand expected to drive strong distillate cracks, and light-heavy crude differential expected to narrow resulting in lower opportunity for high conversion refineries

Source: Wood Mackenzie Refinery Evaluation Model
…with US inland locations benefitting from WTI dislocation, particularly in recent months, promoting high utilisations…..

With oil products retaining international parity, the WTI discount offers significant advantage to some PADD II FCC complex refiners

Brent – WTI disconnect is a US issue reflecting inland location, high stocks and lack of pipeline infrastructure to move mid-Continent crudes to Gulf Coast refineries

Source: Wood Mackenzie’s Product Markets Service
….with US refiners in general having a more benign market environment than that of Europe…..

Source: Wood Mackenzie’s Product Markets Service
....along with capability to steadily increase exports.....some of which is to Europe....

Source: Wood Mackenzie’s Product Markets Service
However, US gasoline demand projected to continue its decline…..so challenging European exports…..

Source: Wood Mackenzie

Note: Causes for higher fuel efficiency of vehicle stock include improved fuel economy of conventional gasoline vehicles, higher penetration of hybrid and other electric vehicles, higher penetration of diesel, shift from light truck to car.
…particularly as Motiva’s Port Arthur refinery expansion adds significant capability to the US refining industry....

PADD II/III Profile, 2010

- Expansion adds 325 kbd of “high margin” capacity
- Simpler FCC capacity challenged

Source: Wood Mackenzie Refinery Evaluation Model
…with large potential upside from tight oil and NGLs…

Source Wood Mackenzie
….With the USGC being the target location for the “liquids fairway”…..
....so potentially transforming US to export centre, whilst challenging competitive position of European stream crackers.....

- Supporting significant surge in cost-advantaged US ethylene capacity
  - ~2.5 Mt of ethylene switching from naphtha to ethane feedstock
  - ~5 Mt of new and expanded ethylene capacity (excluding speculative Shell Marcellus development)

- Supporting ~1 million b/d of new LPG export capacity

Source: Wood Mackenzie NGL Service
The European refining sector becomes part of the Emissions Trading Scheme III in 2013

- Given current proprietary nature of the emissions data, Wood Mackenzie has estimated the site specific emissions using its own methodology.

- Using an average CO2 cost at $45/tonne, the final cost burden for each refinery is calculated as:
  - Total Emissions % Allowances Purchased CO2 Cost

- When applied across all refineries under the ETS regime, we observed an average increase in operating cost of less than 10%.
...so adversely affecting European refineries competitive position (and earnings)

- Fundamentally this results in an increase in the cost base for EU refiners and a loss in competitiveness relative to their non-EU peers
- Demand for refined products could be met via imports if EU refiners operate at reduced rates (i.e. Carbon Leakage)
  - This will be limited as significant reductions in refinery throughputs will trigger a resultant reduction in carbon credits at each site

Source: Wood Mackenzie Refinery Evaluation Model
Conclusions – Diminishing thirst for gasoline contributes to growing US threat to EU refiners, who are about to bear additional costs of carbon

- There is a long term future for the European refining industry, given the sheer magnitude of oil product demand, however:
  - Europe’s export potential is weakening, due to its self-imposed carbon legislation
  - It is not in control of its destiny, as it is subject to developments in other regions

- For the US:
  - Demand growth outlook for US is weak
  - US refining is becoming increasingly competitive on a global basis, supported by its crude advantage
  - Motiva Port Arthur is a major increase in USGC capacity/capability, with limited demand growth to absorb this volumes, so export infrastructure becomes a critical capability to maintain high utilisations
  - Growing NGL supply from US promotes lightening of steam cracker feedslate, improving cost position and so challenging European naphtha crackers
  - US developments hence challenge European refiners’ capability to place light distillates (as difficult to export gasoline and weakening competitive position of its naphtha consumers)

Source: Wood Mackenzie
Alan Gelder

Head of Oils Research

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› Alan Gelder joined Wood Mackenzie in 2005 and now is Head of Oils Research, based in Wood Mackenzie’s London office.

› Alan’s prior role within Wood Mackenzie was Head of the Downstream Consulting team. Alan has led consulting assignments all over the world, focusing on major transactions (projects and M&A) and their alignment with key success factors for industry players and third parties. Alan has recently returned from a two year secondment in Houston and moved to the Oils Research team.

› Alan also has extensive experience of supporting the financial community’s involvement in major projects, such as Saudi Aramco’s recent export-oriented mega-Projects.

› Prior to joining Wood Mackenzie, Alan had 10 years of industry consulting after working for ExxonMobil in a variety of project planning and technical process design roles.

› Alan has a first class Master Degree in Chemical Engineering from Imperial College, London, which has been supplemented by an MBA from Henley Management College.
Introduction to Wood Mackenzie
Summary

Wood Mackenzie is the most comprehensive source of knowledge about the world’s energy and metals industries.

We analyse and advise on every stage along the value chain - from discovery to delivery and beyond - to provide clients with the commercial insight that makes them stronger.

We analyse the assets, markets and companies operating upstream and downstream; in oil, gas, coal, metals and power generation.

Having in-house teams dedicated to every sector means that we are the only provider with an integrated perspective across the industry.

Our reputation is built upon quality proprietary analysis and gives clients the confidence to define their strategy, identify new opportunities, evaluate the markets they operate in and improve their performance against peers.
Business Overview

- We are the primary source of commercial insight to support the decision-making that makes our clients stronger.
- Our reputation has been built on the quality of our research.
- We are the only information provider combining depth with breadth, allowing us to provide a genuinely reliable top level view of industry trends and their implications.
- The constant flow of analysis and ideas between our teams magnifies the commercial value we bring to clients.
- We are consistently rated ahead of our competition for accuracy, reliability and integrity.
- Above all, clients value us for our in-depth industry knowledge.
Business Model

› Wood Mackenzie is led by its clients – offerings are developed in response to clients’ needs

› The business model is founded on:
  • Proprietary information
  • Knowledge and experience of our experts
  • Complete coverage of the energy & metals value chain
  • Constant flow of ideas between sector teams, strengthening the reliability of the analysis

› Many clients do not differentiate between research and consulting, they simply have an issue to resolve – we tailor the help we provide clients, depending upon their circumstances

› Research clients subscribe to our retainer services on an annual (or multi-year) basis:
  • Research provides timely analysis and insight (not just data and information)
  • Delivered to clients’ desktops primarily via the web, allowing 24/7 access from any location

› Consulting solutions are tailored for a particular client, or set of clients facing a similar issue (a multi-client study)
Offerings

Clients turn to Wood Mackenzie for our unique combination of expertise, approachability and integrity.

Wood Mackenzie’s suite of research and consulting offerings provides in-depth commercial analysis and advice on the assets, markets and companies operating upstream and downstream; in oil, gas, coal, metals and power generation, globally:

- **Macro Industry**: Global economic analysis, plus in-depth crude oil market fundamental analysis
- **Upstream Oil & Gas**: Forward looking, commercial analysis and valuation across countries, basins and assets
- **Downstream Oil**: Detailed global supply and demand analysis and refinery valuation
- **Gas & Power**: Analysis of supply, demand and pricing fundamentals, as well as an optimisation model balancing gas supply and demand across the globe
- **LNG**: Full LNG value chain coverage, focussed on commercial and value orientated analysis
- **Coal**: Resource evaluation and coal mining, including mine by mine supply analysis, and long-term demand/supply analysis with price forecasting, internationally
- **Metals**: In-depth asset level cost analysis and market fundamentals for base and precious metals
Research Coverage Across The Value Chain
Differentiators (1)

Wood Mackenzie’s business model, which calls for tight integration of research and consulting, is key:

- Having teams dedicated to every sector of energy and metals means we are the only provider with a integrated perspective of the entire industry.
- The constant flow of analysis and ideas between each of our teams magnifies the commercial value we bring to clients.

Clients can be assured of a deep understanding into the industry on a global and regional level with offices located around the world, placing us closer to our clients and their markets.

We offer a suite of products and services based on an understanding of each client’s unique internal decision making processes.

Our reputation is build on the quality of our proprietary analysis, accessed via privileged industry relationships:

- We are consistently rated ahead of our competition for accuracy, reliability and integrity
- Above all, clients value us for our in-depth industry knowledge
Differentiators (2)

› We are unique – we marry proprietary information with the knowledge of high quality people, to provide professional analysis and insight that clients can’t get elsewhere:
  • We have more than 600 professionals in 20 offices worldwide
  • Working closely with senior teams within our clients, we also provide cutting-edge commentary on topical issues of commercial significance to our clients
  • Through the communities we build, our clients are able to engage with their peers
  • Continual research trips refresh our proprietary data and industry knowledge
  • We are regularly asked to speak at international conferences

› Wood Mackenzie continues to enhance existing products and invest in the development of new products and services to meet the needs of a wide range of client segments.

› Wood Mackenzie places a high value on integrity and openness. Our judgement is guided by the highest ethical standards and our clients trust our analysis and advice, along with the ability of our staff to present it impartially
# Clients

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<th>Category</th>
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<td>Independents</td>
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Clients (2)

- Wood Mackenzie’s major clients are the blue chip stakeholders in energy and metals.
- The company is privileged to count amongst its clients virtually every major player in the global energy and metals industries.
- Over 600 clients including all major energy companies, leading financial institutions, national oil companies, mining companies, governments and government agencies.
- Many of these companies (such as BP and Shell) have been Wood Mackenzie’s clients for over 30 years.
- In addition, Wood Mackenzie is becoming recognised as the leading authority by the media on energy and metals, evidenced by the increasing frequency we are quoted within business publications and leading industry journals.
Global Presence

- Calgary
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- Houston
- Edinburgh
- Addlestone
- London
- Moscow
- New Delhi
- Dubai
- Kuala Lumpur
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- Beijing
- Tokyo
- Perth
- Sydney
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