4th International Conference

Oil, Gas & Petrochemicals in Qatar:
Opportunities and Developments

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Gas to Liquids – a paradigm shift or an opportunity in the margin?

Abstract

Qatar has an aspiration to become the GTL Capital of the World. The key question is to what degree Gas to Liquids will offer resource holders, investors and customers with a significant new and growing energy market.

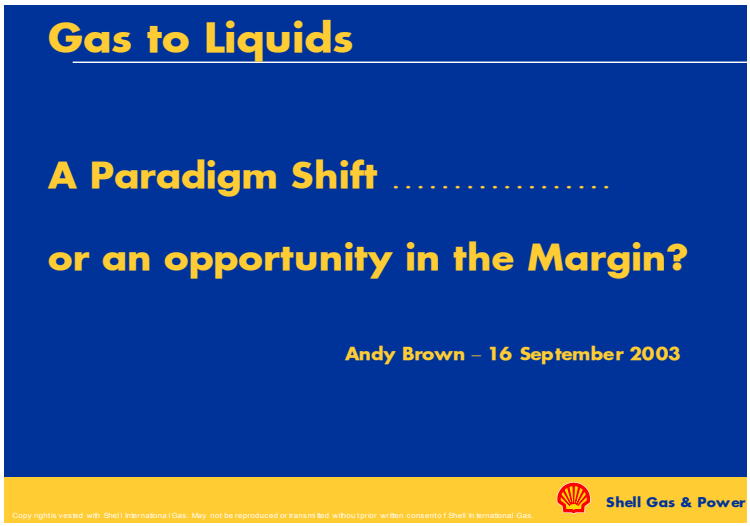
This paper explores what are the key ingredients for success, in terms of future **margins** between the cost of manufacture and product prices, in terms of future **markets**, their size, future requirements of customers and the chances for further sustained **growth**.

The paper draws extensively from Shell's own experience in Gas to Liquids drawn from the Bintulu plant started up in Malaysia in 1993 and Shell's own worldwide leading marketing presence.

The paper concludes that the Gas to Liquids opportunity will create a paradigm shift in energy markets, it will create sustainable and ever more attractive investment opportunities with ever more sophisticated customer offerings. More importantly it will create a valuable alternative way to monetise gas resources for resource holders in a way that is no longer constrained by the pace of market growth, which currently limits the pace of pipeline and LNG investments.

Nevertheless, risks remain high and Shell's own experiences suggest that only those that have the depth and breadth of experience will in the end succeed. The risk to this whole new industry is that corners will be cut and too many risks taken in the pursuit of short term gains, which may threaten the long term viability and reputation of the whole industry. Nevertheless, with the expert guidance of Qatar Petroleum to ensure that risks are properly managed, Shell is confident that an exciting new growing and sustainable industry is about to be born ……and that this industry will be born in Qatar.

Text



1. Distinguished Chairman, Ladies and Gentlemen, Good afternoon.
2. There are many conferences nowadays where Gas to Liquids is featured, three will be held in the next three months in Doha alone. So I am introducing today a trilogy of speeches from Shell Executives in order to join up the messages we would like to bring.
3. At the Gas to Liquids conference to be held here in October my colleague Niels Fabricius will focus on the **technical issues** of Gas to Liquids and talk in depth about our 140, 000 bbl/d project we intend to build in Qatar, a project which is under negotiation with Qatar Petroleum. In December at the World Petroleum Congress Conference, Jack Jacometti will talk about the exciting **Marketing Opportunities** of GTL products. But today I would like to take a step back and focus on the long term prospects of the GTL industry from an **economic standpoint.**
4. What I want to address is a strategic question and that is…. how significant will gas to liquids be in tomorrow's energy market?…. is it just a niche play… a short term opportunity in the margin….. or a paradigm shift, which will have significant impact on the future of the energy industry?
5. His Excellency, Minister Al Attiyah has had the foresight to declare that he wishes Qatar to be GTL Capital of the World, what does this mean and what are the implications for such an aspiration?

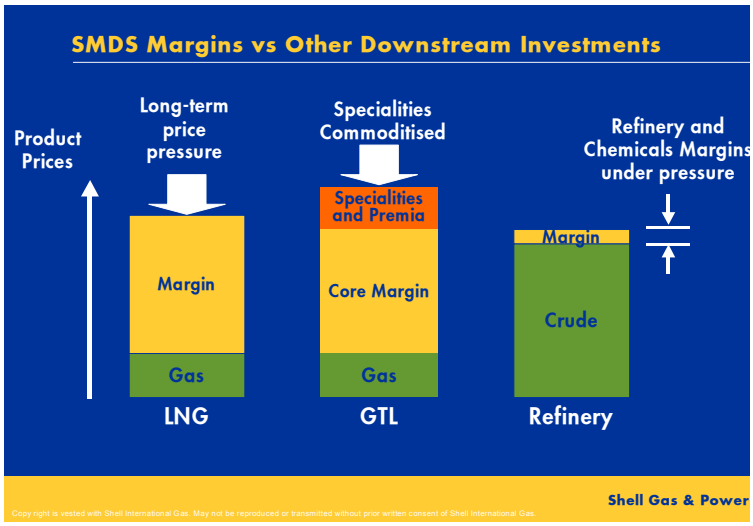
6. To answer this point I think we should ask ourselves three fundamental questions: *(slide 2)*

   a. Firstly, is there sufficient **margin** in Gas to Liquids between the value of the gas feedstock and the liquid products? Does it make commercial sense, does it compete with alternative ways to monetise gas?

   b. Secondly, is there a **market** for Gas to Liquids products? Is this market large enough? Will customers want to buy these products?

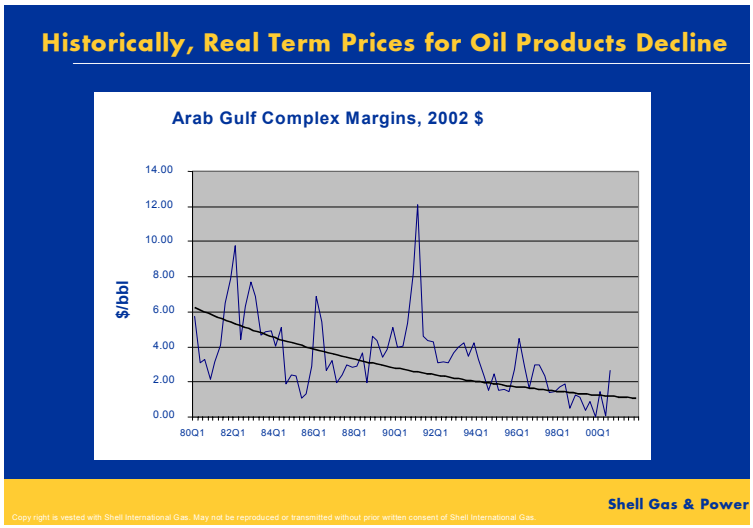
   c. Thirdly, is there potential for sustainable **Growth** in the Gas to Liquids world? Will there just be short term opportunities in products which will soon become commoditised, or will there be a sustaining value proposition to pursue?

7. I would like to start by looking at the economic **margin** *(slide 3)* and here we should look not only at the rent that gas to liquids provides to investors and resource holders, but also the alternative investment opportunities that the investors and resource holders may be considering.



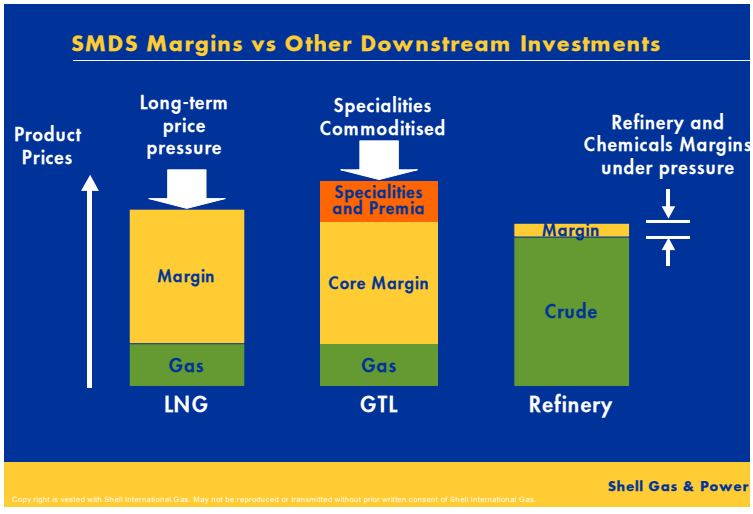
8. *(Slide 4)* I think it is useful to compare GTL with other investment opportunities in the manufacturing sector. In particular how GTL might compare with investments in LNG chains and in Complex Refineries. In the case of LNG, the market is healthy, LNG demand is growing at 7% per year, but supply still threatens to outstrip this demand. Prices in established markets are under pressure. Scale up and cost improvements are keeping the business attractive, but margins are being squeezed.

9. Complex refineries, on the other hand, rely on a margin between the value of finished petroleum products and crude oil. For those that have invested heavily in refining have been disappointed in the erosion of these margins in recent years. *(Slide 5)*



These margins have become thinner, whilst product specifications have become ever tighter.

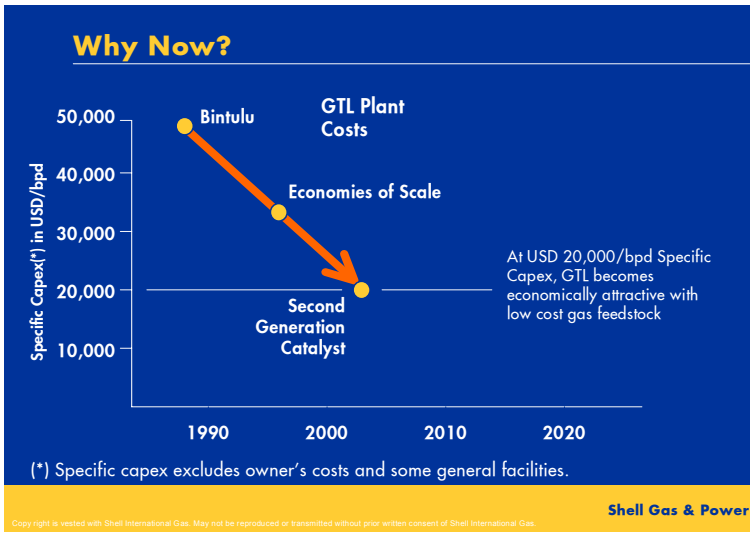
10. So how can we bridge the value gap between relatively low cost gas and the premium enjoyed by high quality petroleum products. The answer is Gas to Liquids *(slide 6)*.



11. Whereas there will be some erosion in the value of the speciality products as they saturate their markets, as long as oil prices remain at a reasonable level the margin on the middle distillate products will remain healthy. This core middle distillate margin is central to the Gas to Liquids value proposition.

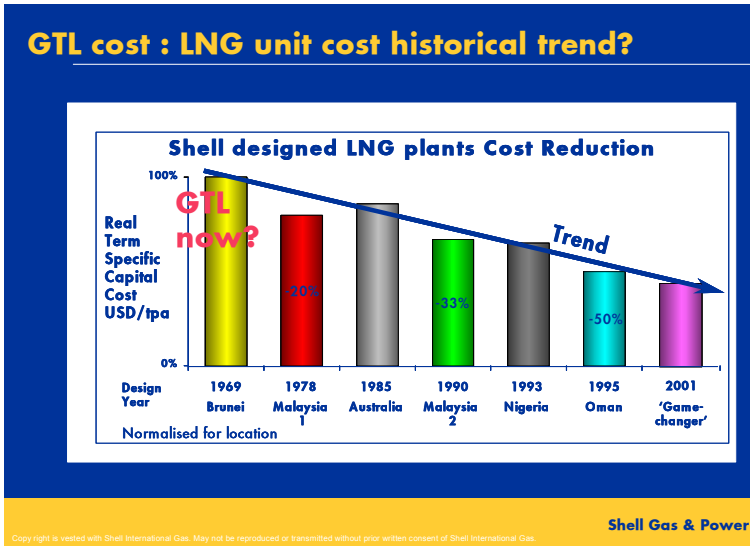
12. This all seems so obvious, so why has no-one unlocked this potential before now. Well the simple reason is costs. Whilst the Capex cost of GTL remained above $20,000/per specific barrel of installed GTL capacity there was just not enough gross margin between the price resource holders expect for their gas and the value of the products.

13. However below $20,000/bpd we reach a watershed when GTL becomes attractive. *(Slide 7*)

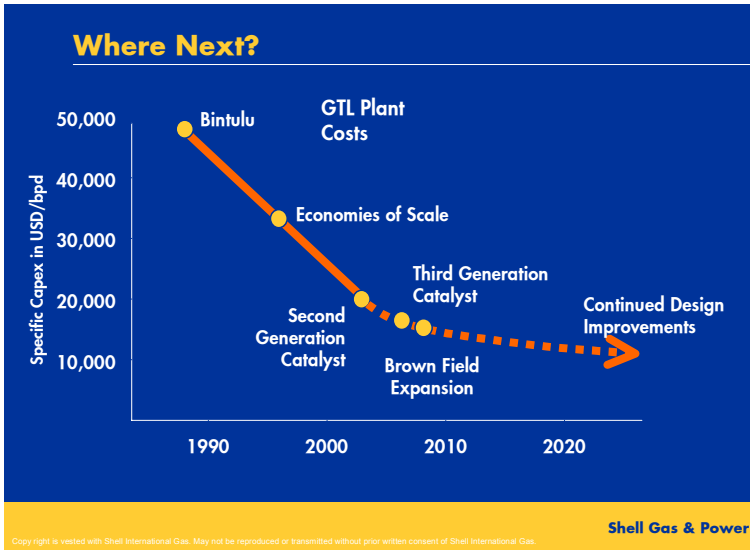


The early pioneers, namely Sasol and Shell built plants at more like $50,000/bpd. Without these relatively large, first wave commercial plants we would not have worked down this cost curve to bear the fruits of the current economic wave today. Relentless focus on cost,…economies and scale….and significantly improved catalyst performance have been central to this revolution.

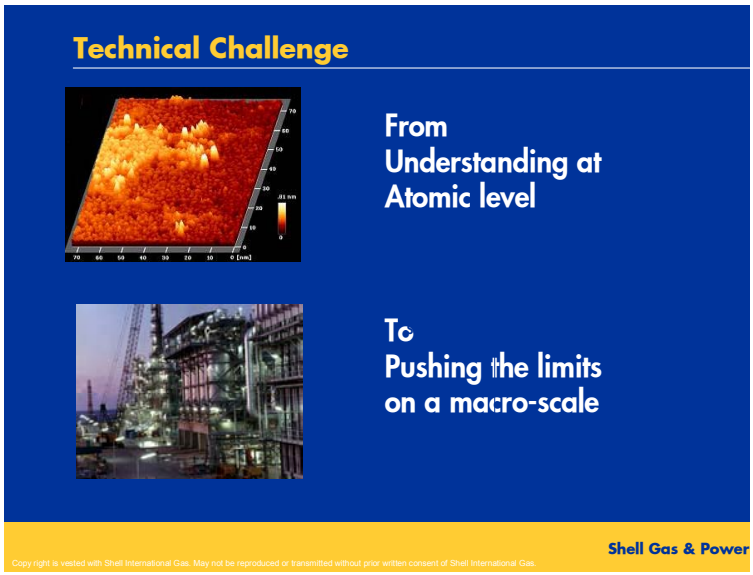
14. So what does the future hold….if we enjoy the same learning curves that we have experienced on LNG *(slide 8)*



15. …. Where specific costs have halved over thirty years….we can anticipate further specific cost improvements in the GTL industry. *(Slide 9)*



16. But a word of warning, Gas to Liquids conversion is a highly complex process. The 140,000 kb/d GTL plant we plan to build in Qatar will be of the same complexity as Stanlow, the largest refinery in the United Kingdom. The process is highly integrated in which you have to control a number of strong chemical reactions. *(Slide10)*

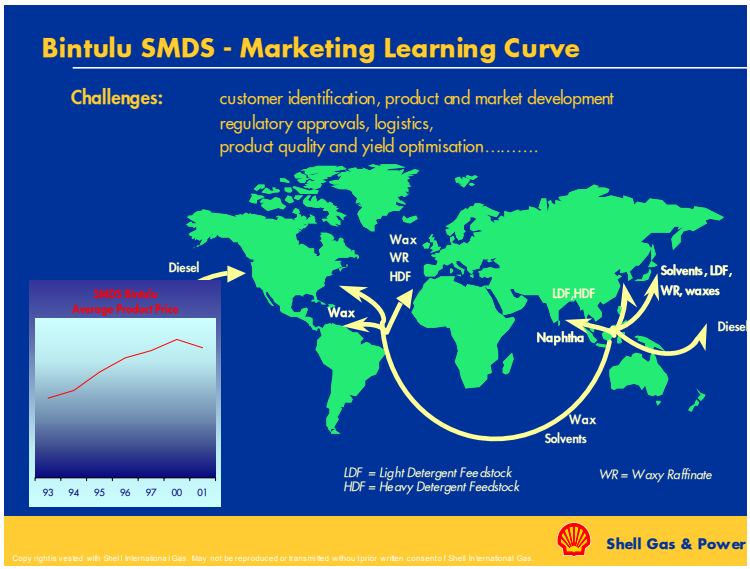


It is one where you have to pay attention at atomic level to catalyst behavior and at the same time harness massive heat flows

17. *(Slide 11)* We started up our 12,500bbl/d plant in Bintulu in 1993, we have learnt the hard way what it takes to design, build and operate such a plant, we have learnt things that laboratory size experiments can never tell you. The learning curve is a tough one.
18. Now let's move to the **market**,

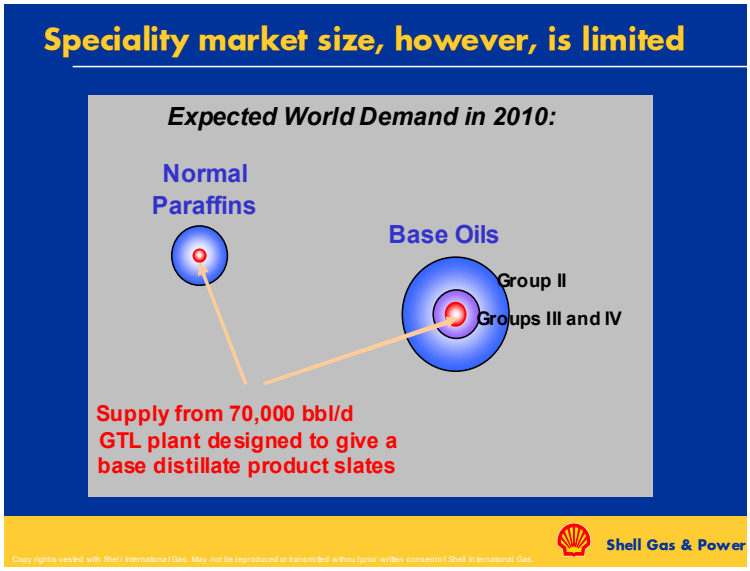
(Slide 12) …. is there a 'market-pull' for our products? What is the size of the market? What is the customer value proposition? And will the products meet the customer's requirements of the future, is it sustainable?

19. If we consider the type of products that this process can produce. We group these in specialities and middle distillates. The specialities….waxes, normal paraffins, lubricant baseoils…. are excellent premium products. For a plant like Bintulu more than half of the product slate is in specialities deriving a large proportion of the value. From Bintulu's experiences, the average product price has gradually increased over time, as illustrated here *(slide 13)*,



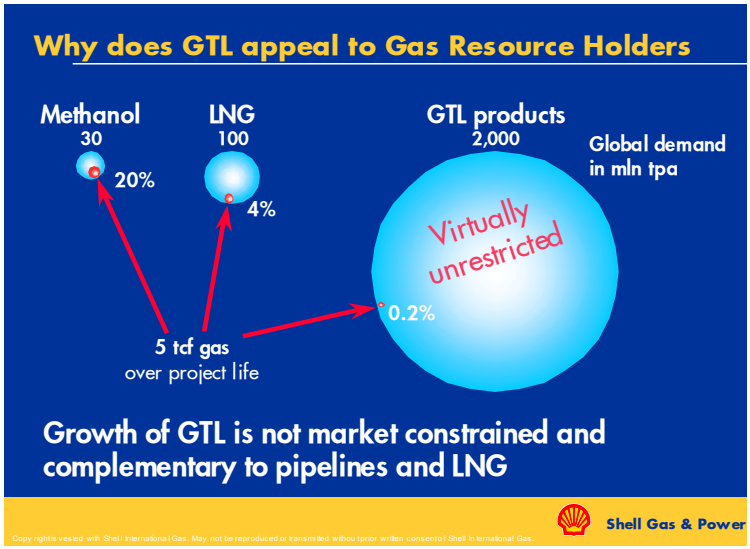
20. Reflecting a richer product slate and a shift in market segmentation towards specialties.

21. But market size is an issue in specialities and the demand for some of these products will be quickly satisfied by the first few GTL plants. For Shell's planned plant in Qatar we would not plan to produce all of the specialities produced in Bintulu, but we do plan to manufacture normal paraffins and base oils. *(Slide 14)*



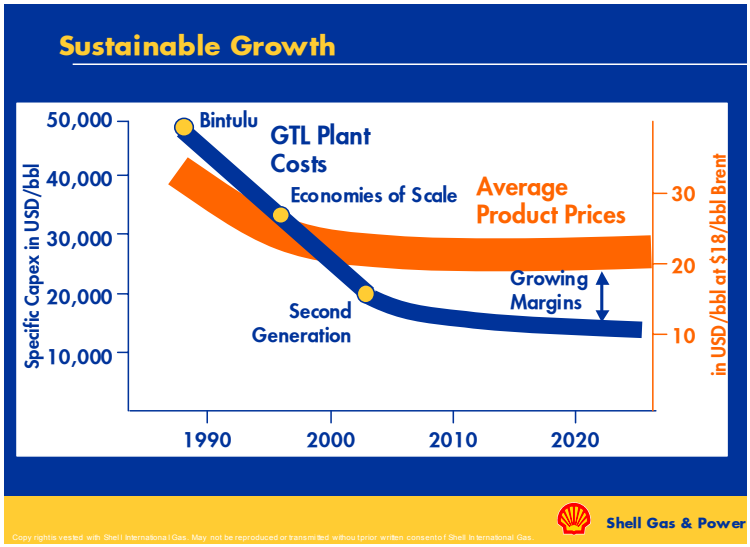
However, even these markets are of limited size, which undoubtedly will be impacted by the first wave of world scale GTL capacity.

22. However, these specialities will be a key enabler to support the economics in the early plants. Thereafter we believe GTL will become a 'premium middle distillate' market proposition.



23. *(Slide 15)* One of the strongest features of GTL is that the market for middle distillates…..the core of the long term GTL proposition…. is near infinite, some 20 times the size of the current global LNG market.

24. So whilst the cost of manufacturing GTL production will decline the average GTL product prices will stabilise at the value of the core middle distillate products, *(slide 16)*



25. We therefore anticipate that the value of future GTL projects will grow and the rent available to be shared between resource holder and investor will increase.

26. But what of the attractiveness of the Middle Distillate core to the consumer. GTL Gasoil, or GTL transport fuel, is a very special product, completely clear, odourless, virtually free of sulphur and aromatics with a very high cetane number. The product is starting to excite both regulators and the automotive and refinery industries alike. In the refinery industry, products from our Bintulu plant has been used in California since 1994 to blend CARB diesel, one of the tightest diesel specs in the world. When used in a compression ignition diesel engine its emissions performance exceeds that of the very best refinery derived diesels.

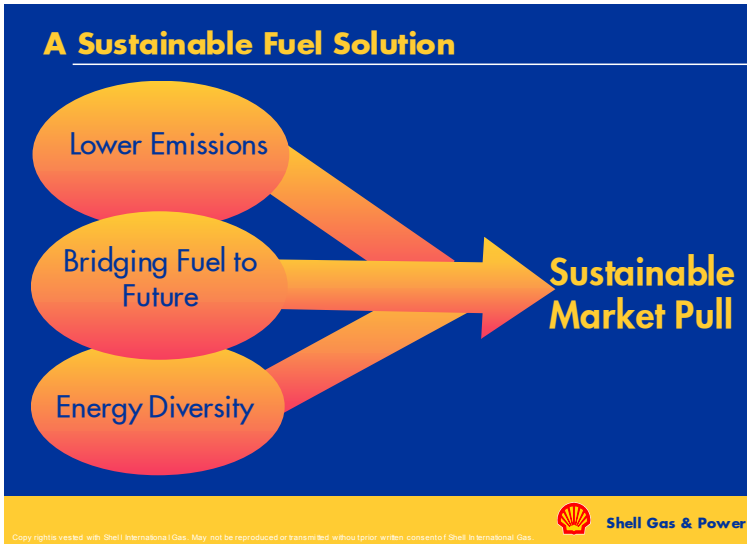
27. *(Slide 17)* Shell already market a GTL blend produced by the Bintulu plant called Shell Pura in Thailand, this is a popular product for which consumers are willing to pay a premium. The product was launched early last year as a blend nationwide and has subsequently won substantial market share at a premium.

28. *(Slide 18)* We continue to roll out GTL blend retail offerings in other part of the world, and a recent example is the launch of Shell Diesel 2004 in Greece. The new product is available from about 30 Shell retail stations mostly in the Athens area, making Greece the first country in Europe in which Shell is distributing a GTL blended product. The product, developed as a contribution to a cleaner environment for the Olympic Games, was launched by Shell in

conjunction with the ATHENS 2004 Organising Committee for the Olympic Games.

29. *(Slide 19)* We also have a comprehensive programme to create awareness of the benefits of GTL transport fuel to consumers and regulators in the key markets. Examples are a collaborative trial with Volkswagen in Berlin, and with Daimler Chrysler in London. German Chancellor Gerhard Schröder launched the Berlin trial in May and emphasised that close cooperation with Shell, Volkswagen and other automotive industry players was strongly supported by his government. UK's Green Fuels Minister David Jamieson launched the London Bus trial.

30. VW and Daimler Chyrsler's involvement demonstrates that major automotive players are now becoming very interested in the unique properties of GTL transport fuel and Shell is working closely with a number of them. Tailoring engines to fuels for performance is a particularly fertile long term goal. Engine manufacturers today have to put up with a random cocktail of hydrocarbon compounds that comes from refining crude, but with GTL we can tailor the fuel to the exact narrow range the manufacturer specifies and so enjoy new levels of performance, for example higher engine efficiency, or more effective exhaust gas after treatments.



31. *(Slide 20)* So looking long term at the fuels of the future we see GTL gasoil and naphtha well placed as a key bridging fuel, either for more efficient hybrid diesel engines or indeed as an excellent liquid fuel stock for Fuel Cells in a move to the Hydrogen economy. The future is bright and the prospect for sustainable growth is good.

32. Finally, I think we must consider energy diversity and security. GTL is clearly a new diverse source of liquid transport fuel; it challenges the paradigm that liquid fuels can only be economically derived from Crude Oil. GTL is also fully aligned with sustainable development. I believe that the demands at the highest level of government, to support sustainable development whilst guaranteeing energy security without sacrificing economic sense will create additional demand pull for GTL fuels.

33. So, what is my conclusion, is GTL a paradigm shift or an opportunity in the margin?

34. I think it is clear what we believe

    a. Firstly, we believe healthy margins for resource holders and investors will exist.

    b. Secondly, we believe the markets are robust and near infinite in size

    c. And thirdly, we see enormous growth potential as consumers, OEMs and Governments create demand pull for GTL products.

35. I think that His Excellency's bold vision to make Qatar the GTL capital of the world is a vision with tremendous foresight. Shell for its part is keen to contribute to realizing that vision through the construction of its $ 5 bln, 140,000bbl/d integrated GTL project here in Qatar.

36. But there are risks and I firmly believe that we have a collective responsibility to make sure that the first wave of world scale GTL plants are built to be reliable, safe and efficient. *(Slide 21).*

a. **Reliable…..** as the economics of these plants will be quickly eroded if the plants do not start up and operate flawlessly.

b. **Safe**……. As experiences in the Nuclear industry have shown, safety and confidence of the public is paramount.

c. **Efficient……** as proper use of valuable hydrocarbon resources is essential. CO2 emissions from a GTL plant are relatively high. On a life-cycle basis, CO2 emissions from the Shell SMDS system comparable to the equivalent refinery system, a conclusion reached by comprehensive study conducted by PriceWaterhouse Coopers. Nevertheless, we have a collective responsibility to design our plants as efficiently as possible to safeguard the reputation of GTL for tomorrow.

37. I have personally enormous faith in Qatar Petroleum's ability to steer the world into this new GTL era. This is a serious responsibility. If this is done with QP's normal professionalism I believe that GTL will not just be just an opportunity in the margin, but a serious Paradigm Shift in Energy Markets. Thank you.