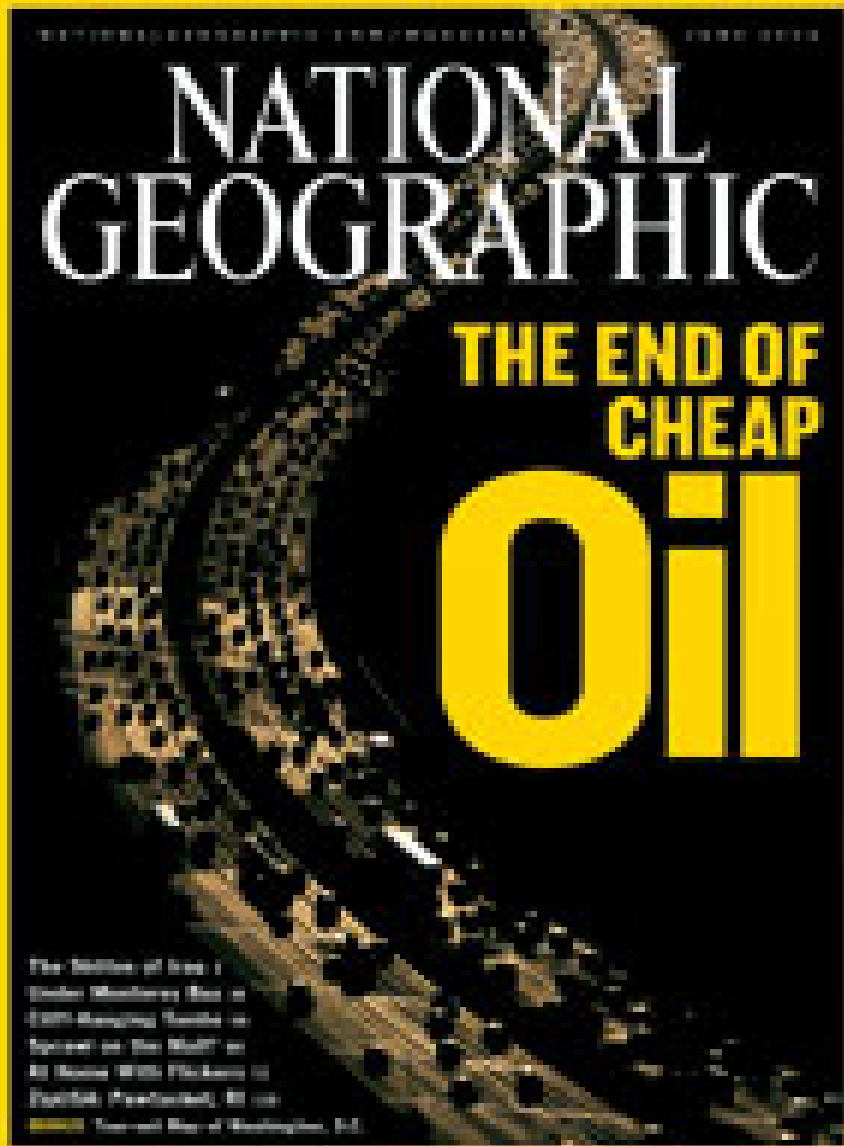


Available in paperback for \$14.95 / \$19.95 (hardcover) / \$14.95 (eBook) / \$14.95 (audiobook)



Oil Prices and LEVs

Ed Benjamin
CycleElectric
International
Consulting Group

- 我接到通知,主辦單位希望今年的研討會盡量以英文呈現.這對我是好消息,我的中文僅侷限於幾個字,而且發音非常的糟糕
- 爲了大家的方便,今天的內容將會翻譯成中文,將於兩個星期內張貼於CycleElectric網站上(ww.CycleElectric.com)



- 我(I)接到(receive)通知(notification),主辦單位(organizer)希望(hope)今年(this year)的研討會(conference)盡量(as possible)以英文(by English)呈現(present).這(this)對(to)我(me)是(is)好消息(good news),我的(my)中文(Chinese)僅侷限(only limited)於幾個字(in few words),而且(also)發音(pronounce)非常的(very)糟糕(badly)
- 爲了(for)大家(everybody)的方便(convenience),今天的(today's)內容(content)將會(will be)翻譯(translated)成(into)中文(Chinese),將於(Will be in)兩個星期(two weeks)內張貼(posted)於CycleElectric網站上(on CycleElectric website)(ww.CycleElectric.com)

Hubbert's Peak

- 1956 – M.K. Hubbert developed a method of predicting what years would see peak, or highest oil production. His method of prediction has proved to be accurate, repeatedly.
- His methodology, executed by more than one researcher, predicts world wide peak oil production – now.

English Only

- I am informed that this year, the seminar organizers wish for material to be presented in English only. Good news for me – my Chinese is limited to a handful of words badly pronounced.
- As a convenience, this presentation will be translated to Chinese and posted on the CycleElectric website in about 2 weeks.
www.CycleElectric.com

Quotes From Chevron Oil Company Advertisement

- “The world consumes two barrels of oil for every barrel discovered.”
- “The world consumes 84 million barrels of oil per day.”
- “By 2030 the number of cars in the world will increase by 50%.”
- “The world has been finding less oil than it is using for twenty years now.”

The world consumes two barrels
of oil for every barrel discovered.

So is this something you should be worried about?

The fact is, the world has been finding less oil than it's been using for twenty years now. Not only has demand been soaring, but the oil we've been finding is coming from places that are tough to reach. At the same time, more of this newly discovered oil is of the type that requires a greater investment to refine. And because demand for this precious resource will grow, according to some, by over 40% by 2025, fueling the world's growing economic prosperity will take a lot more energy from every possible source.

The energy industry needs to get more from existing fields while continuing to search for new reserves. Automakers must continue to improve fuel efficiency and perfect hybrid vehicles. Technological improvements are needed so that wind, solar and hydrogen can be more viable parts of the energy equation. Governments need to create energy policies that promote economically and environmentally sound development. Consumers must demand, and be willing to pay for, some of these solutions, while practicing conservation efforts of their own.

Inaction is not an option. But if everyone works together, we can balance this equation. We're taking some of the steps needed to get started, but we need your help to get the rest of the way.

willyoujoinus.com

The world consumes 84 billion barrels of oil a day.

By 2020 the number of cars in the world will increase by 100.

World Energy Demand



Chevron Steps Taken:

Thinking to the future:

- Committing over \$100 million every year on renewable energies, alternative fuels and improving efficiency

Finding even more energy today:

- In 2004, achieved exploration record 78% higher than 10-year industry average
- Using steamflooding to extract heavy oil that was previously unrecoverable - more than 1.3 billion barrels from one field alone



Human energySM

Many New Users of Oil

- Most of world population is increasing oil use.
- Many new cars.
- Many new motorcycles.
- More air travel.
- More electrical generation.

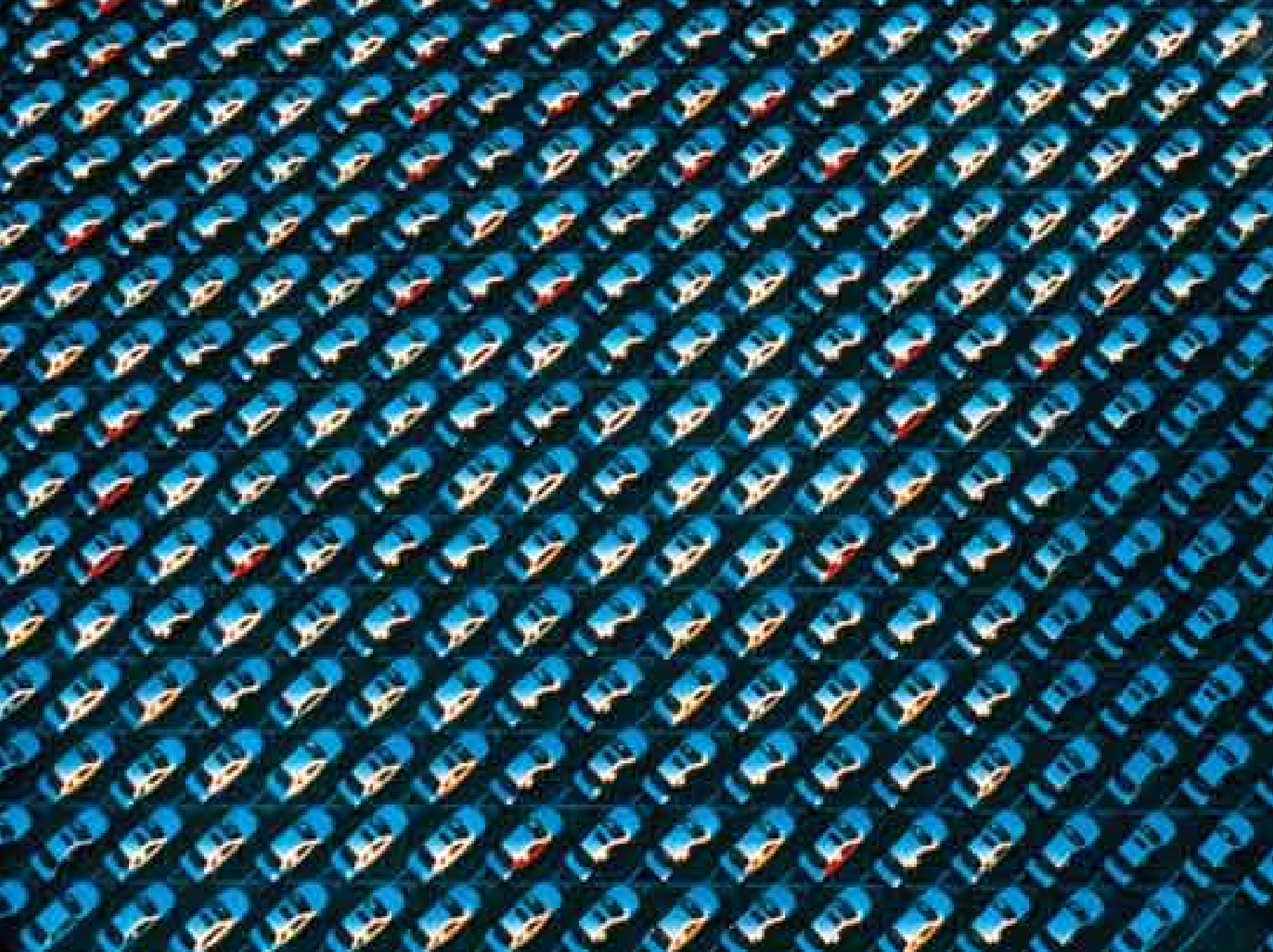
- China's total vehicle demand will reach 5.3 million units this year, an increase from last year's 4.43 million, said Xu Changming, an auto researcher at the State Information Centre.
- Actual sales says Automotive News were 5.7 million inside China.

Indians Buying Cars

- **South Asia**
Feb 24, 2005 - **India zips ahead**
By Indrajit Basu

KOLKATA - Although its auto market is shrinking and is likely to be dampened further in the next few years, China continues to attract the biggest chunk of auto sector foreign investment in Asia. But that's about to change. Judging by the growth rate that India's auto sales recorded in 2004 and the slew of new launches that the country is poised to see this year, India seems to have finally arrived in the big league of Asian car markets, making foreign investors sit up and take notice.

With almost 24% growth in car sales in 2004, India has emerged as the fastest-growing car market in the world, outstripping China's estimated 13.7% growth last year. But India's potential looks even more promising, so much so that investment banking firm Goldman Sachs has predicted that it will have the largest number of cars by 2050. However, at this point, India is still far behind in terms of car sales compared to other Asian giants like China, South Korea and Japan. But considering that India's auto industry really took off only as recently as 2000, it has done amazingly well.



Too Many Cars, Not Enough Fuel

People Everywhere Want a Car for Personal Transportation

But....

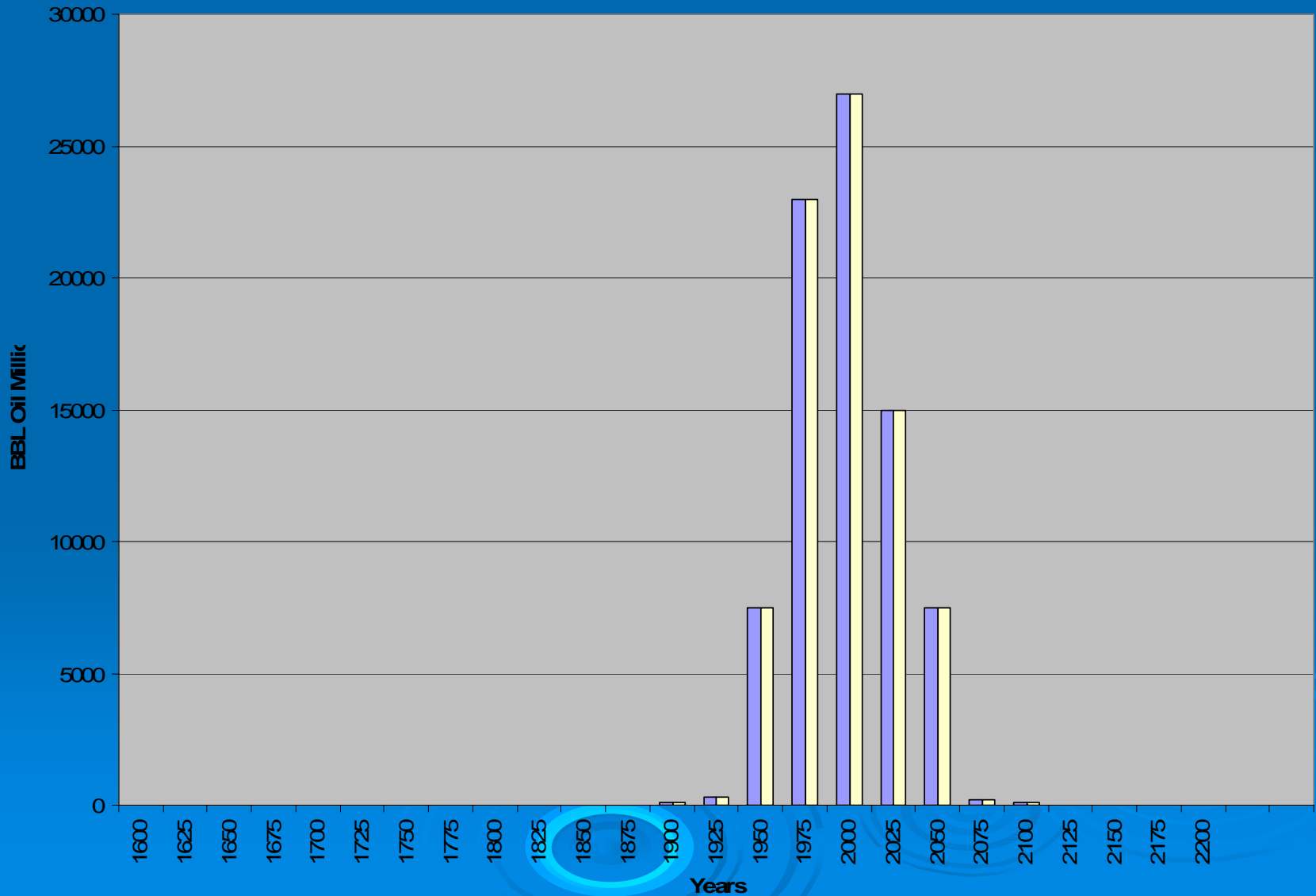
The Price and Availability of Fuel is About to Become a Big Problem!



Prediction Total Oil Production

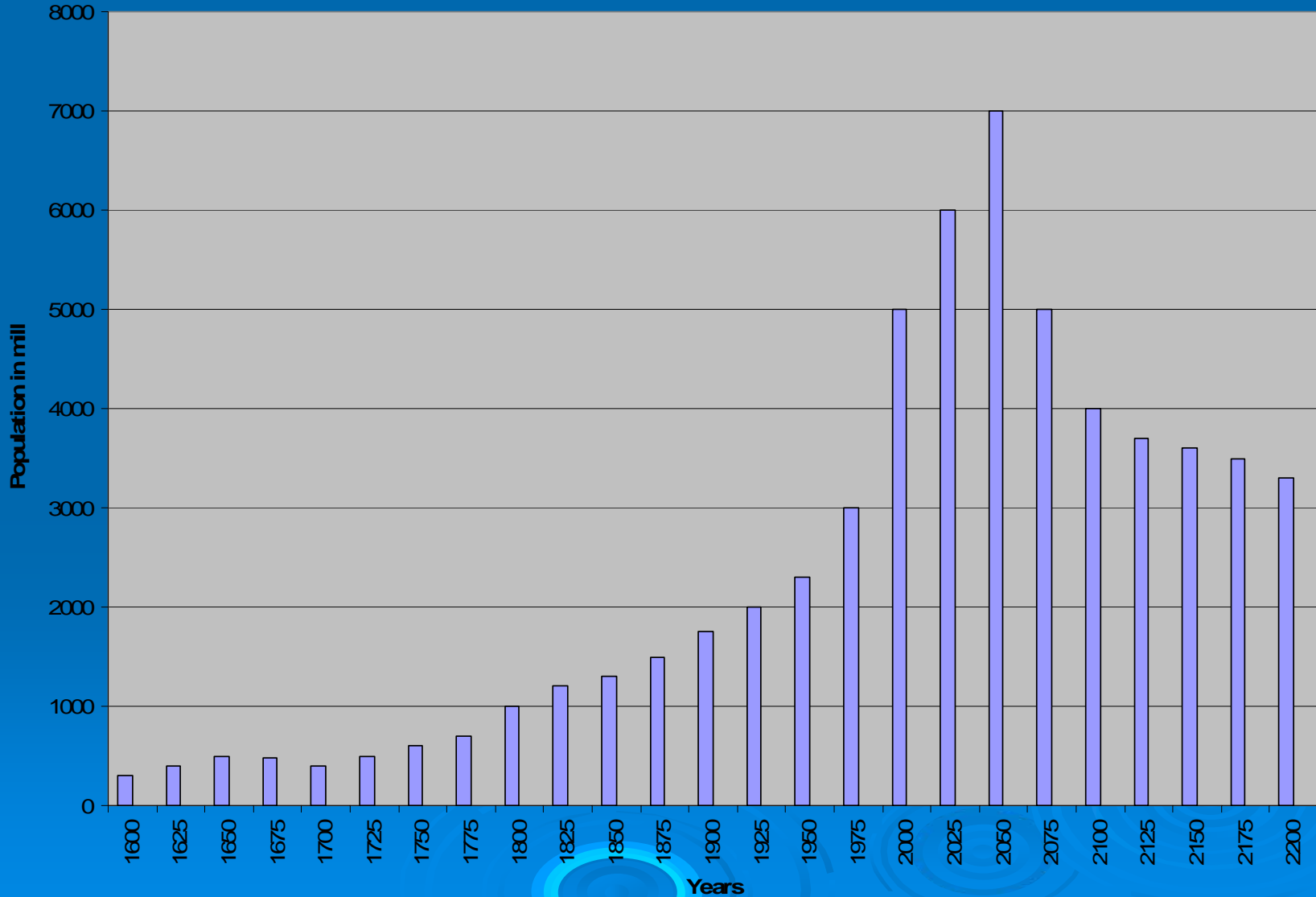
1600 - 2200

Oil Production

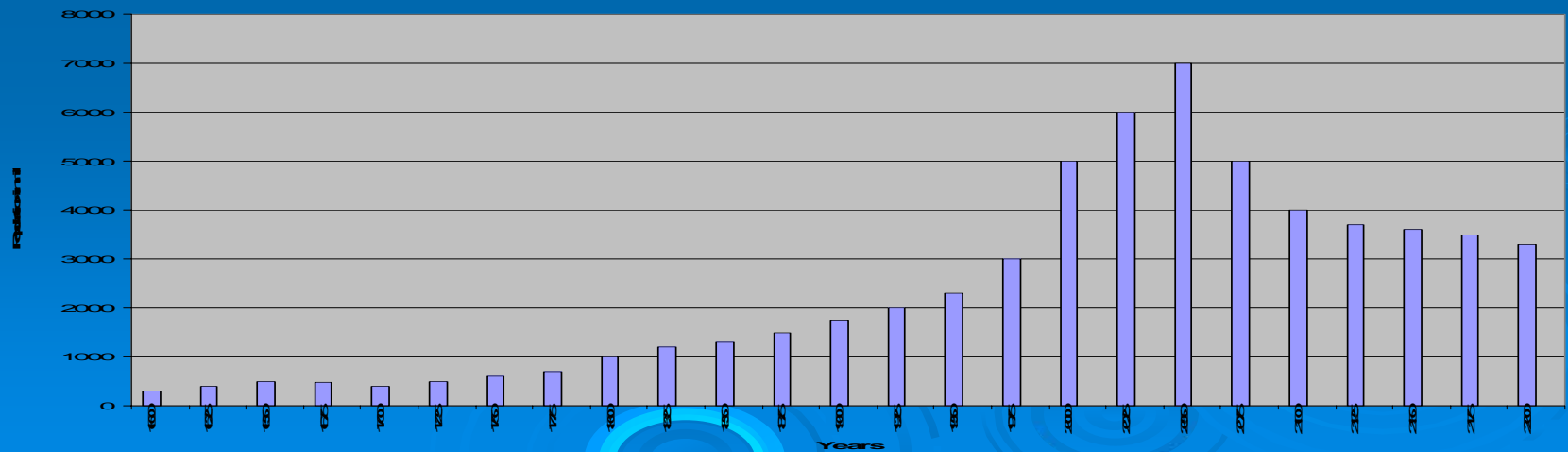
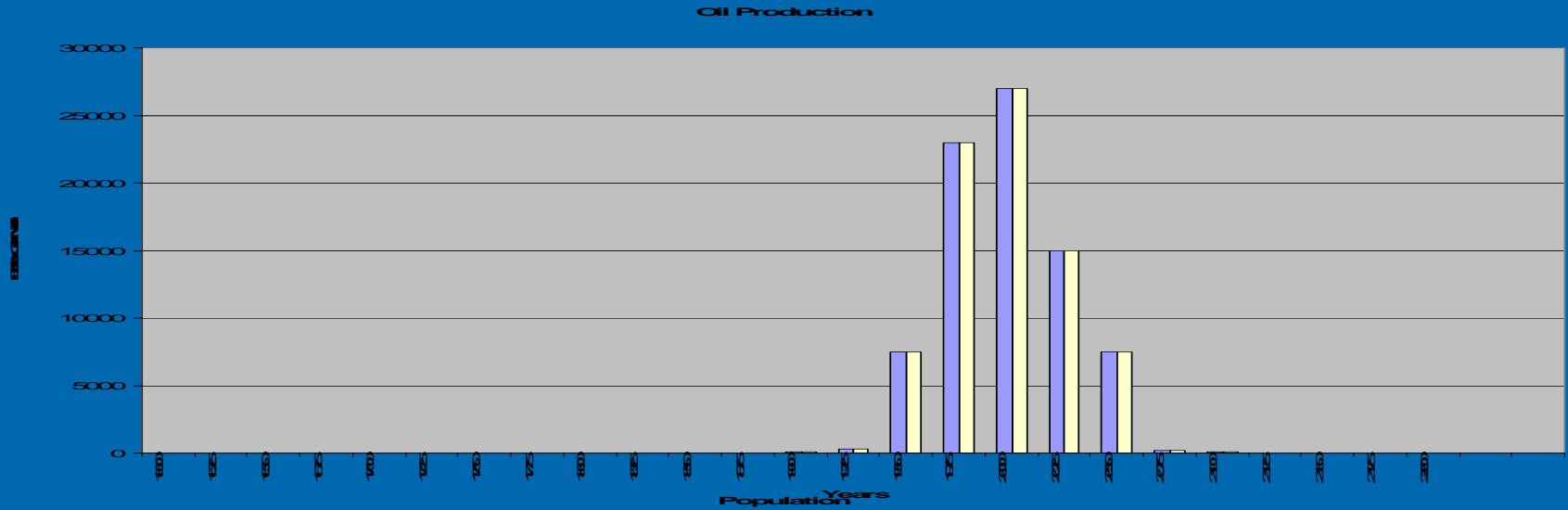


World Population 1600 - 2200


Population



Oil Production Vs. Population



Some Users Must Have Petroleum

- Chemical industry
 - Aircraft must use Petroleum
 - Plastics
 - Medical products
 - Agricultural Production
 - Heavy transport
- 

Price Always Higher



FORTUNE

Ready for \$262/barrel oil?

Two of the world's most successful investors say oil will be in short supply in the coming months.

By [Nelson Schwartz](#), FORTUNE senior writer

January 27, 2006: 4:40 PM EST

In this article, the author explains that disruptions in the Mid East and South America will result in Oil prices between 89.00 and 262.00

More Problems for Cars...

- Not enough land or money to build the roads and parking lots to supply all the world with cars.
- Road and bridge maintenance expense – even in USA and EU = big problems.
- **But not difficult to provide roads and parking for two wheelers.**

World Population is Moving To Cities – Creating Dense Populations

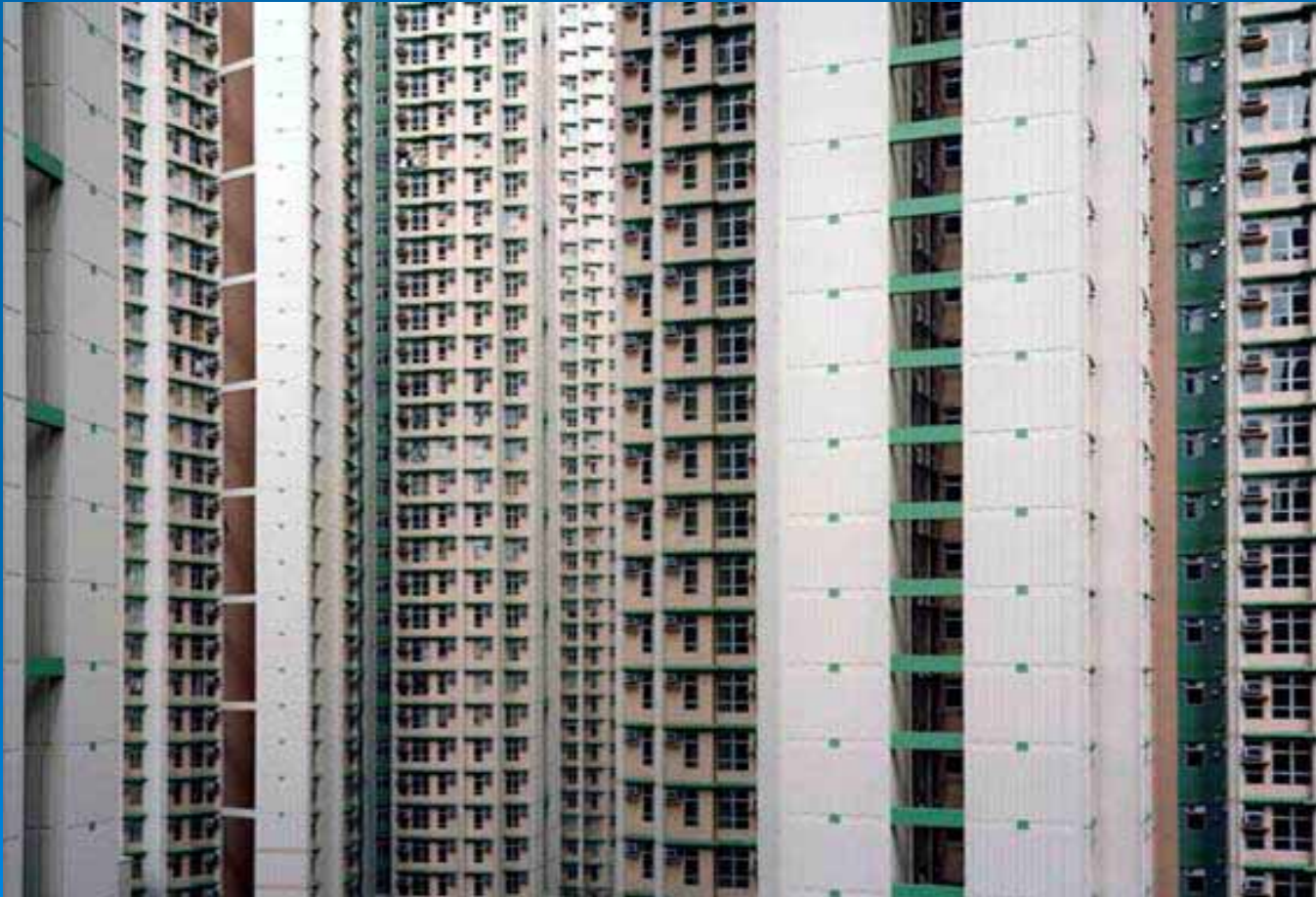


Parking

- Auto Parking spaces (including access) requires 37.2 square meters of land and pavement per car. Cost ranges up to \$25,000 per space to build in some cities.
- Electric Bike Parking Spaces require $\frac{3}{4}$ of one square meter of any open surface.



Some Cities Have No Chance for Parking of Four Wheelers



Vehicles Per Lane

- At 40KPH, one lane can support 300 – 500 cars per hour. High speed roads up to 2,000 per hour.
- Same Lanes can handle 6,000 bicycles per hour.



Emissions are a Big Problem



Tail Pipe Vs. Smoke Stack

- Some people complain that electric vehicles just move emissions from the tailpipe of the car to the smokestack of the generating plant.

Actually, generating plants are more efficient than cars, with less emissions for the energy used. And the smokestack is many kilometers away from the nose and lungs of the commuters. The tailpipe is a few meters away.

Other Fuels?

- Diesel – comes from same source. Same problems as gasoline. Heavier Particulate emissions. More expensive engine.
- LPG – needed for heating and power generation. But can be used for transport. Limited supply. Greenhouse gases and lower power.
- Ethanol – good alternative, but a direct trade of food for fuel. As population rises, this will become more difficult and expensive.
- Hydrogen – Clean, powerful, but expensive to make. Distribution not available yet.

Electric Powered Transport is the Answer

- Light Electric Vehicles are the solution to many of these problems.

Electric vehicles of many types will be used – buses, trains, battery cars and trucks, hybrid cars and trucks – but the individual transport solution for most of the world population will be electric two wheelers.

Many Sources of Electricity – Future Supplies Certain to Exist

- Coal – abundant, cheap, dirty, popular,
- Hydro – abundant, cheap, clean, popular
- Nuclear – cost effective, no greenhouse gas, complex, expensive, controversial, major source for future.
- Solar Cell – rapidly becoming cheap and practical. Major expansion coming.
- Hydrogen Fuel Cell – not now, but soon.
- Wind – Cheap, popular, clean, Now.
- Any fossil fuel – gas, oil, gasoline, kerosene.

Recycling?

- Recycling of batteries is the correct answer to the objections about battery “pollution”.
- Most Lead Acid Batteries already recycled today.



Most Transportation Events are Short Distance

- A “Transportation Event” is one person going on one trip.
- Examples: Home to Metro station, home to work, home to bus stop, station to work, etc.
- Work, market trips, and child care trips usually short distance. Average in USA is only about 8.04 KM. Most other places have shorter transportation distances.

LEV Better than Bicycle

- Bicycle – cheap, practical, very efficient, popular. Problem: Humans do not like to sweat, many cannot use due to physical limitations. Prestige issues. Limited range and speed.

Electric two wheeler as clean at the point of use. Faster, no sweat, no need for physical exertion. Quite cheap. Prestige is higher than bicycle.

LEV Better than Motorcycle

- 2 Stroke Motorcycle / Motor Scooter – cheap, fast, high prestige, world wide distribution. Problems: Very dirty exhaust. Noisy, uses gasoline.

LEV can be as fast, completely silent and clean at point of use. Cost is, today, higher, but will continue to fall. NO dependence upon gasoline.

LEV Better than Car

- Automobile – fast, quiet, comfortable, high prestige. Problems: Cost, fuel, emissions, parking space, roadway space. Traffic jam.

LEV advantages over Automobile: Cost, parking, traffic congestion, emissions, no gasoline dependency.

Other Transport?

- Metro and Train are natural allies and companions to LEVs.
- Buses and trains can carry LEVs as they do bicycles now.



Bikes, Electric Bikes – all components of Metro/Bus/Train/ future transport



Regulatory Changes Happening Already

- Beijing allows electric bikes.
- USA passes favorable law.
- EU Laws support LEVs.
- Multi-modal transport getting strong funding.
- Import duties...

What to Expect from USA

Car is King...Cars define the person and his status...

Road systems, culture, habits...hard to change. Distances, even inside cities can be great.

Car is only practical solution in many places.

Americans will continue to use cars despite expense...

USA Adapts...

- More hybrid cars – already big sellers.
- More small cars – happening already.
- More car sharing (car pools)
- More buses, more bus use.
- Light rail use and construction will increase.
- Commuter trains – more and better.
- More use of bicycle.
- Adopt use of LEVs.


Future Role of LEVs in USA

- Short range transport for everyone. Up to 2 KM.
- Transport for kids – save car expense for school, after school activity.
- Transport for lower income workers – service workers.
- Dense cities – NYC example.





What Changes in the Product?

- More demand for quality – defined as weather resistance, durability, reliability.
 - Quick charging.
 - Longer range – achieved by better battery, more efficiency in system.
 - Fenders, lights, locks.
 - Carry bags, briefcase, helmet.
- 



What to Expect From EU


“The Car is My Castle” – Europeans will continue to drive, despite expense. But, they will use cars less.

EU has well developed mass transport – trains, street trains, metros.

EU cities are bicycle friendly and walkable.

EU transition will be easier than USA.

EU Adapts...

- More use of existing mass transport.
 - More use of bicycles.
 - Expansion of small car and Hybrid car use.
 - Expansion of mass transit.
 - Adoption of LEVs for short range trips and by older population.
- 

What Changes in the Product?

- Dutch and German commuter bikes – but with electric motor added – like the Sparta.
- Continued demand for reliability, weather resistance, long range – at ever lower price points.



Specifics on Change

- Lithium batteries, followed by fuel cells.
- Silent motors. Maybe hub, maybe not.
- Increased torque – either through motor design or transmission.
- Sophisticated user interface. Interactive.
- Quick charging.
- Weather proof.
- 2 year or more warranties world wide.
- Battery warranty.
- After-sales service networks in all markets.

Changes to Product...

- Lighter
- Farther
- Smoother
- More and better integration
- Durable, reliable, weatherproof
- Intuitive to use for consumers
- Theft proof
- Better design – beauty plus function.

FALCON



CRAFTSMEN

Larger LEVs Will Become Popular

- Just as motorcycles moved from 50cc to more powerful 150cc and up – LEVs will move to more power as soon as energy storage solutions exist.
- USA allows 750 watts. EU limits going up.
- New users – three wheelers, small delivery vehicles – need more power.













What Time Frame?

- Fuel supplies are running out now.
- Prices are rising now.
- People around the world do not accept this – slowing acceptance of LEVs in mass market.
- My prediction – heavy LEV growth in 2 years. Very strong increases every year for next 25 years.

Caution!

- I am not always right.
- Hard to predict almost every element of this developing market.
- Most predictions of the end of the car have been wrong over the last 30-40 years – but this time the issues are stronger and closer than ever before.

What to Do Today?

- LEV industry needs to develop technology further. We have made great advances, but not enough for needs of world market.
- Improve quality. End focus on lower and lower prices and build really good, reliable and long lasting LEVs.
- Develop strong supply chains.
- Develop strong distribution. Create well funded advertising and marketing programs.

Where Will Competition Come From?

- Japanese companies have been developing appropriate products for years.
- 4 stroke motorcycles have many advantages.
- Alternate fuel and hybrid two wheelers.
- Fuel cells should be part of LEV, not competition for LEV.
- Normal bicycle.







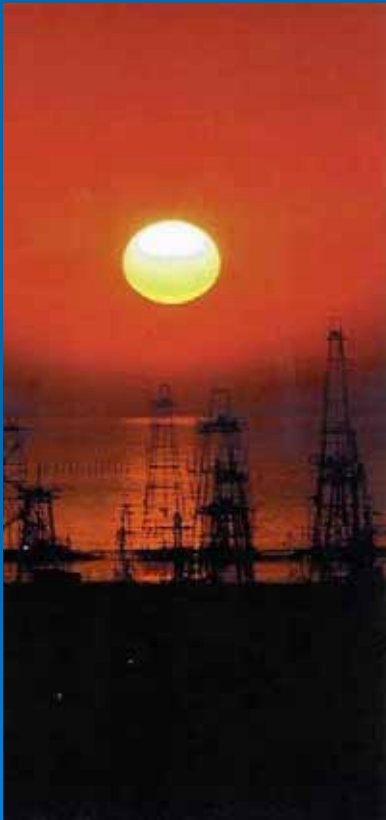


Taiwan Strengths

- Electric motor cycles have been in development in Taiwan for more than 10 years...ITRI and many Taiwanese have extensive experience.
- Many major electric bike companies are owned by, or invested in by Taiwanese.
- Electric mobility market dominated by Taiwan companies – good start on LEVs.
- Taiwan has the sophistication in both business practice, technology, and management to dominate the LEV industry.

All of These Factors Ensure that LEV has Bright Future

➤ And the time is now.



Questions?

- The author can be reached for complaint, complement or questions at ebenjamin@CycleElectric.com
- All email will be responded to.
- This presentation will be posted at www.CycleElectric.com

Thank you!

