



Australia's low cost semiconductor developer

Investor Presentation

November 2007

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Giles Bourne Commercial Manager

Commercial in Confidence



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BluGlass profile

- Delivery of novel manufacturing technology to the global semiconductor market
 - Strong proprietary and competitive position
 - ✓ substantial reduction in gallium nitride (GaN) wafer production cost – WWK modeled 48%
 - ✓ reduced environmental impact
 - Rapidly growing, multibillion dollar markets for LED and RF/power electronics applications
 - Strong international technical and commercial team
 - Commercial spin off from Macquarie University, manufacturing facility based in Silverwater, Western Sydney
- ASX:BLG
 - oversubscribed IPO
Sept 2006 raised A\$10M
 - Market Cap. A\$50M
 - 135 M shares on issue
 - Top 20 shareholders
44.7%
 - Cash Balance A\$10.3M
30 Sept 2007
 - A\$5M AusIndustry
Commercial Ready
grant 2007- 2009
 - Cash Burn A\$0.9M p.q.

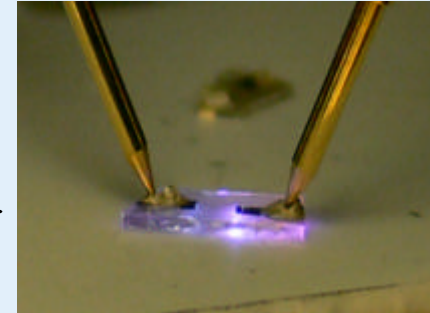
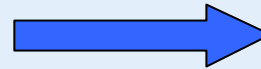
Highly skilled team of industry experts

DIRECTORS	MANAGEMENT	TECHNOLOGY DEPARTMENT
Dr. Michael Taverner Chairman	David Jordan Managing Director and Chief Executive Officer	Dr. Marie Wintrebert-Fouquet Senior Research Scientist
David Jordan Managing Director and Chief Executive Officer	Geoff King CFO	Guy Reynolds Equipment Engineer
Dr. Peter Dodd Non-executive Director	Dr. Scott Butcher CTO	Satanarayan Barik Research Engineer
Greg Cornelsen Non-executive Director	Giles Bourne Commercial Manager	Dr. Tim Dabbs Senior Research Scientist
Chandra Kantamneni Non-executive Director	Conor Martin Equipment Design and Development Manager	Alanna Fernandes Research Engineer
	Piotr Glowacki Facilities Manager	Arran McKay Research Scientist
		Phil Dixon Equipment Engineer

many years of experience in semiconductors, research and international business

Why focus on Gallium Nitride?

Gallium nitride (GaN) is a semiconductor material that electroluminesces (emits light) under applied voltage



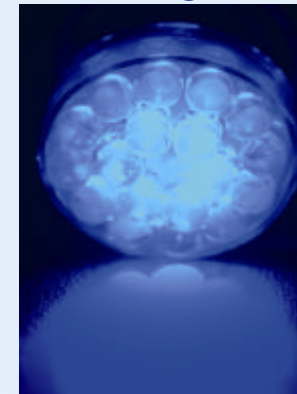
GaN dominates the blue / green Light Emitting Diode (LED) & UV Laser Diode (LD) market. LED applications include mobile phone and laptop screen backlighting, torches, car displays, traffic signals.



Environmental benefit underpins the potential for significant LED penetration of the US\$100B general lighting market



Lower cost for GaN production a key enabler



Our breakthrough technology

Remote Plasma Chemical Vapor Deposition (RPCVD)

Low pressure reaction chamber in which a glass substrate is heated to 500 - 700°C.

✓ new low cost substrates

Remote plasma generated active nitrogen species react with trimethyl gallium (TMGa) depositing a thin film of GaN on the wafer.

✓ safer process

Large area deposition capability (>6", cf 2" industry standard) offers substantial production efficiencies.

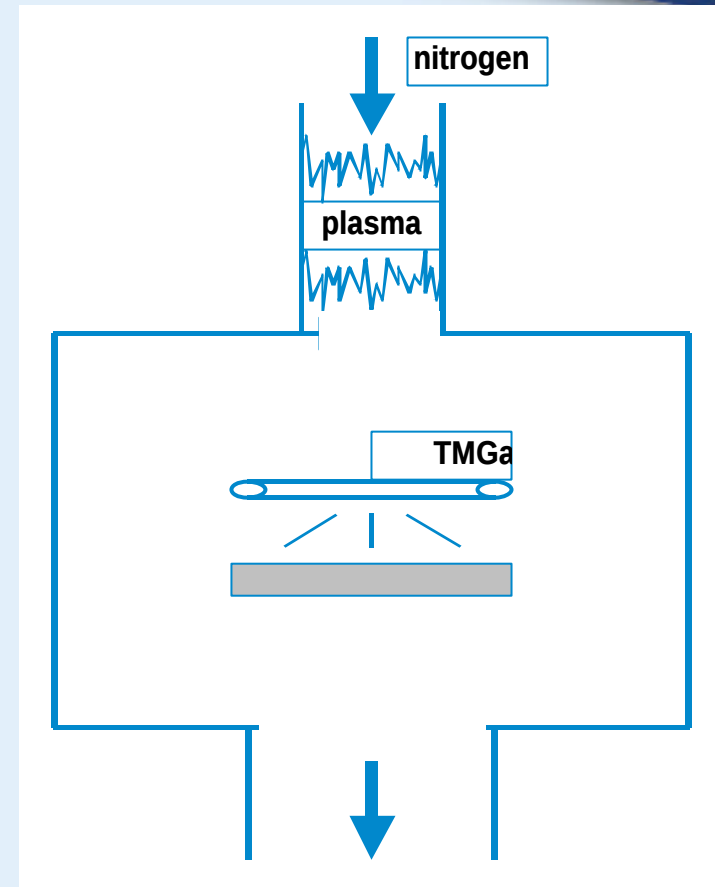
✓ highly scalable

Strong IP position within competitive IP environment.

✓ commercially attractive

✓ environmental benefits

✓ cost driven



Our “green” credentials

Environmental benefits accrue at two levels:

GaN wafer manufacturing process (RPCVD vs MOCVD)

- Reaction temperatures reduced (500-700°C vs 1,000°C plus)
- Nitrogen replaces toxic ammonia



Energy efficient LED devices

- Currently replacing **incandescent bulbs**, **first** commercialised in the late 1800's, more than a century ago
- LED lights are currently 4 - 5 times more energy efficient, about the same as compact fluoro's (CFL's) but targeted for much higher
- last 50 times longer than incandescents, 5 times more than CFL's, with higher targeted lifetimes (up to 100,000 hours)
- LED's contain no mercury, unlike CFL's



Professor Shuji Nakamura, blue GaN LED pioneer and 2006 Millenium Prize winner –
“It is estimated it is possible to alleviate the need for 133 nuclear power stations in the US by the year 2025 if white solid-state lighting is implemented”

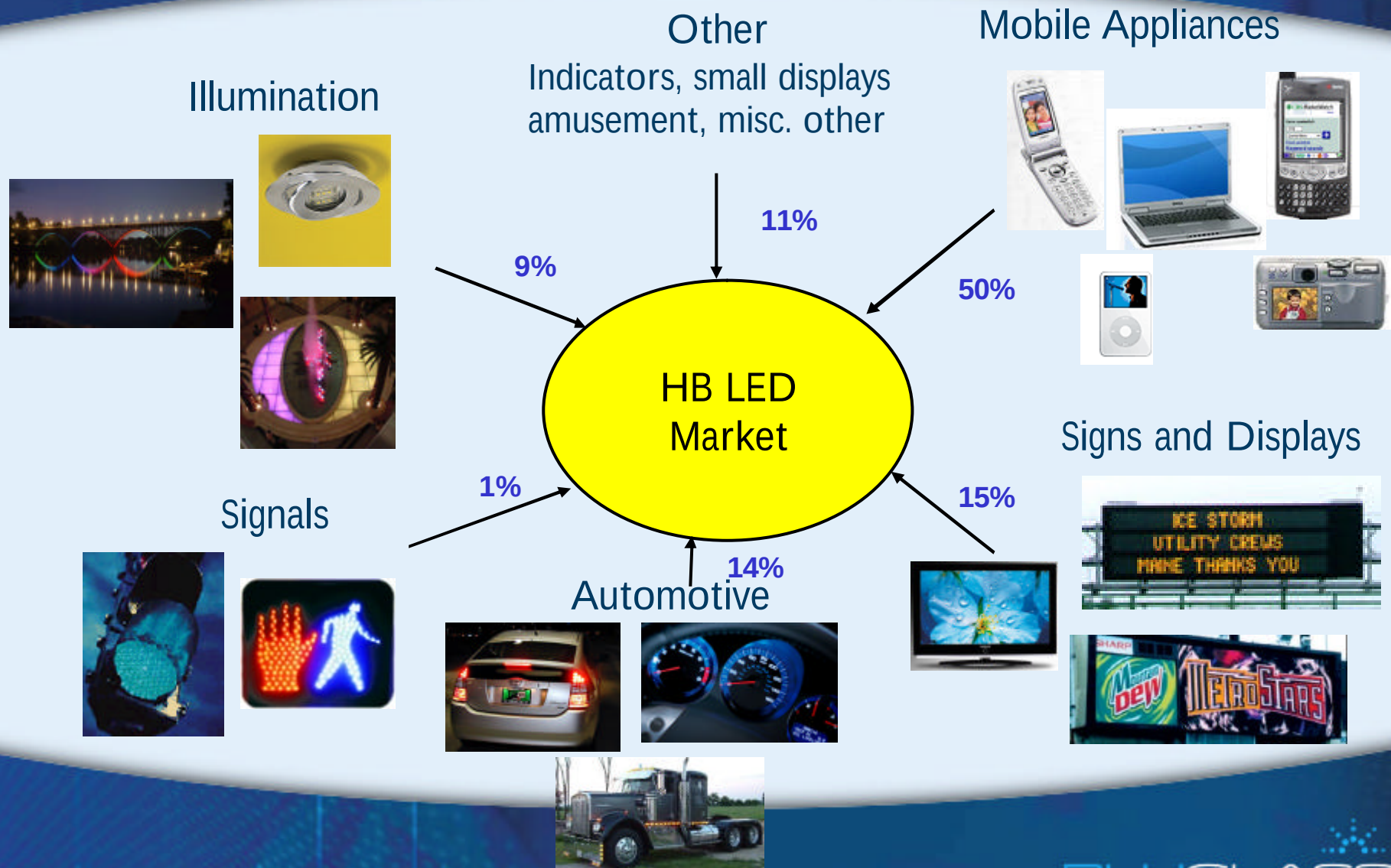
LED evolution

- Red and amber LEDs in commercial production for over 30 years (billions sold). These use somewhat similar material types to GaN (alloys of GaAs & GaP)
- Red LED's used mainly as small indicator lamps and alphanumeric displays because of performance limitations
 - Did not cover full color spectrum (blue end missing)
 - Poor outdoor performance in full sunlight
- **GaN based blue LED materials “revolution” occurred in the early 1990s**
- **GaN** process initially developed by Nichia / Toyoda Gosei (Japan), with Cree (USA) following soon after producing high brightness blue and green LEDs (and white, using blue + phosphor). Many producers have since entered the market.
- GaN HB-LED devices are currently fabricated by Metal Organic CVD, a high cost process

➔ HB LED manufacturing “revolution” from 2008 enabled by BluGlass RPCVD

High Brightness LED application segments

A rapidly growing and evolving market



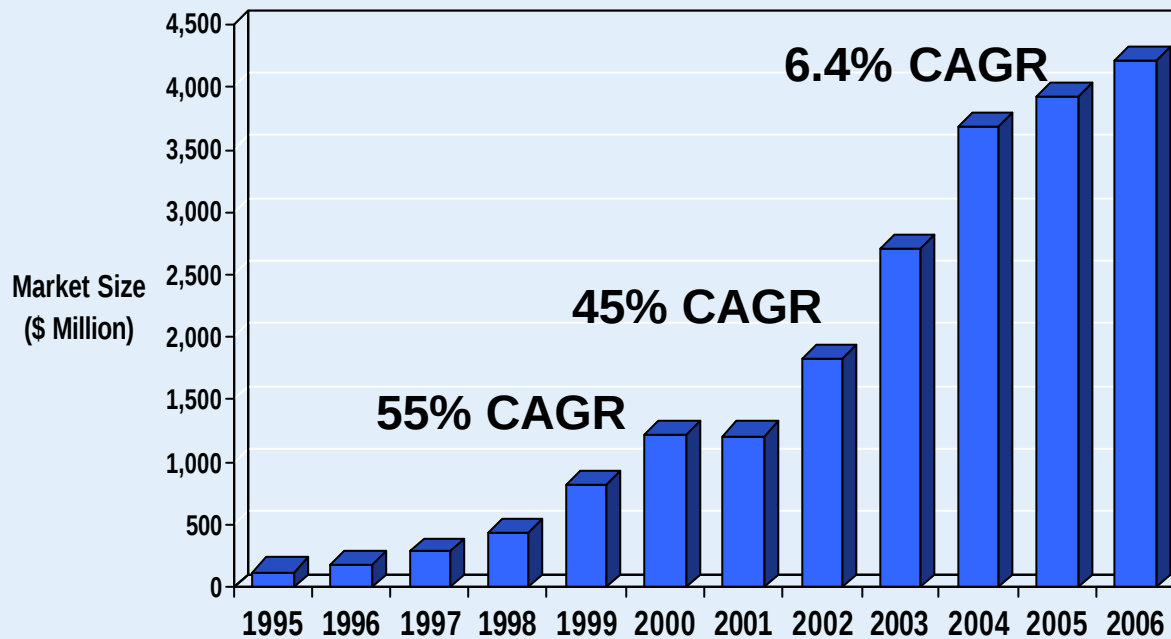
Source: Strategies Unlimited

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LED sector emerging as next star industry*

Overall LED market revenues US\$6.3B for FY06F and CAGR growth of 15% predicted for FY06 – FY10F *Source :Deutsche Bank

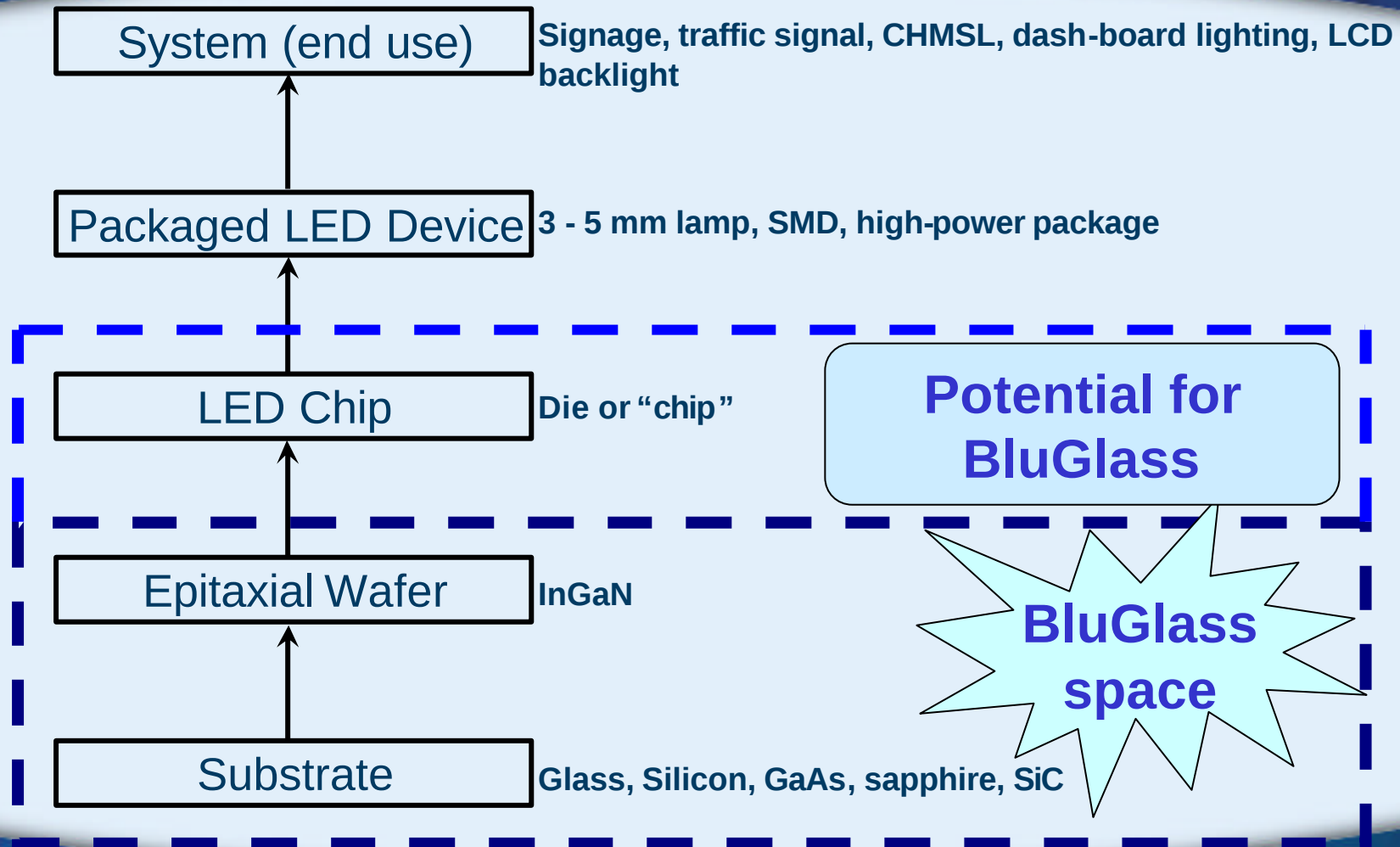
17.6% CAGR to \$9.4 billion in 2011 Source: Strategies Unlimited



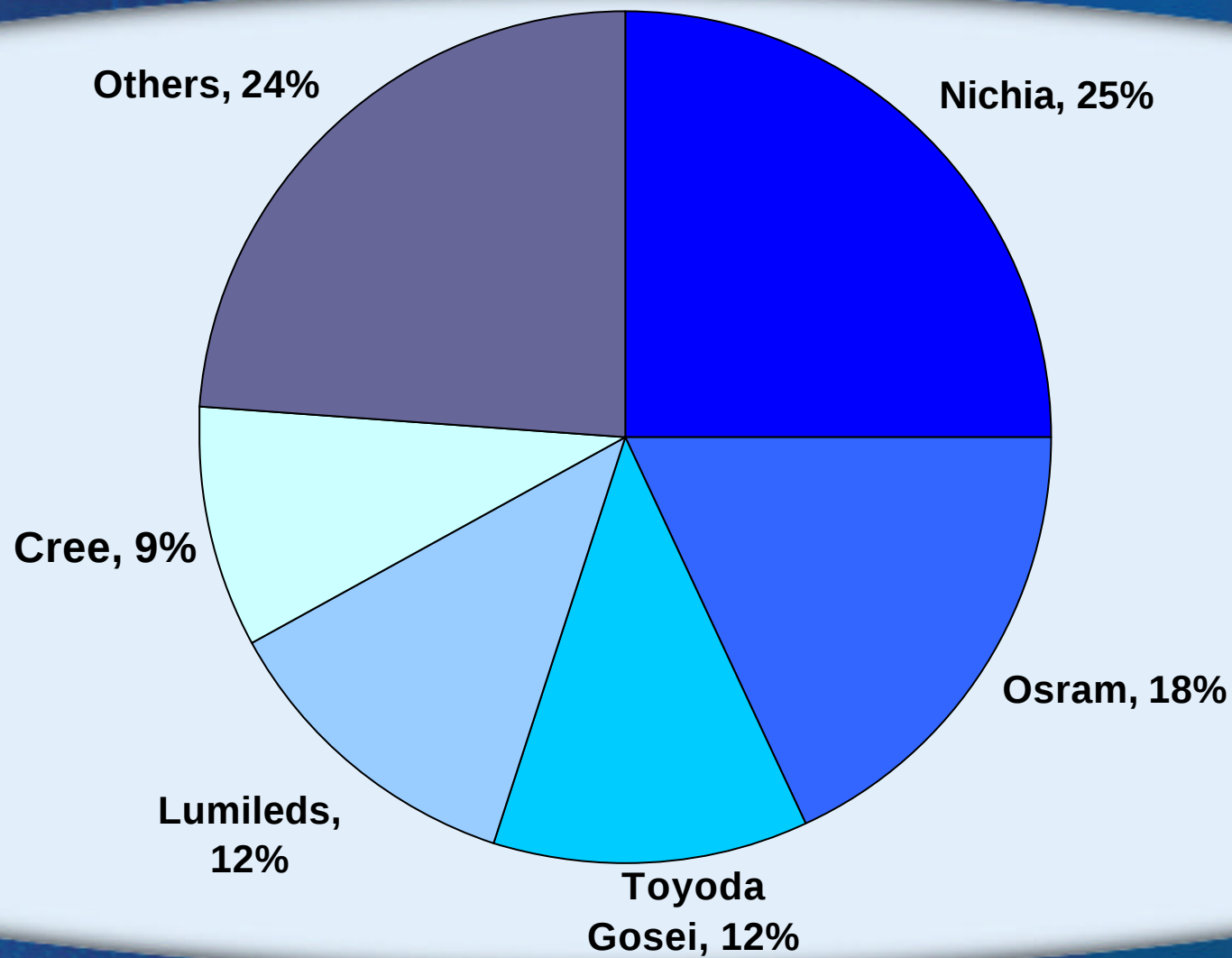
Source: Strategies Unlimited

Market growth will be driven by lighting, display backlights (large panel LCD) and automotive

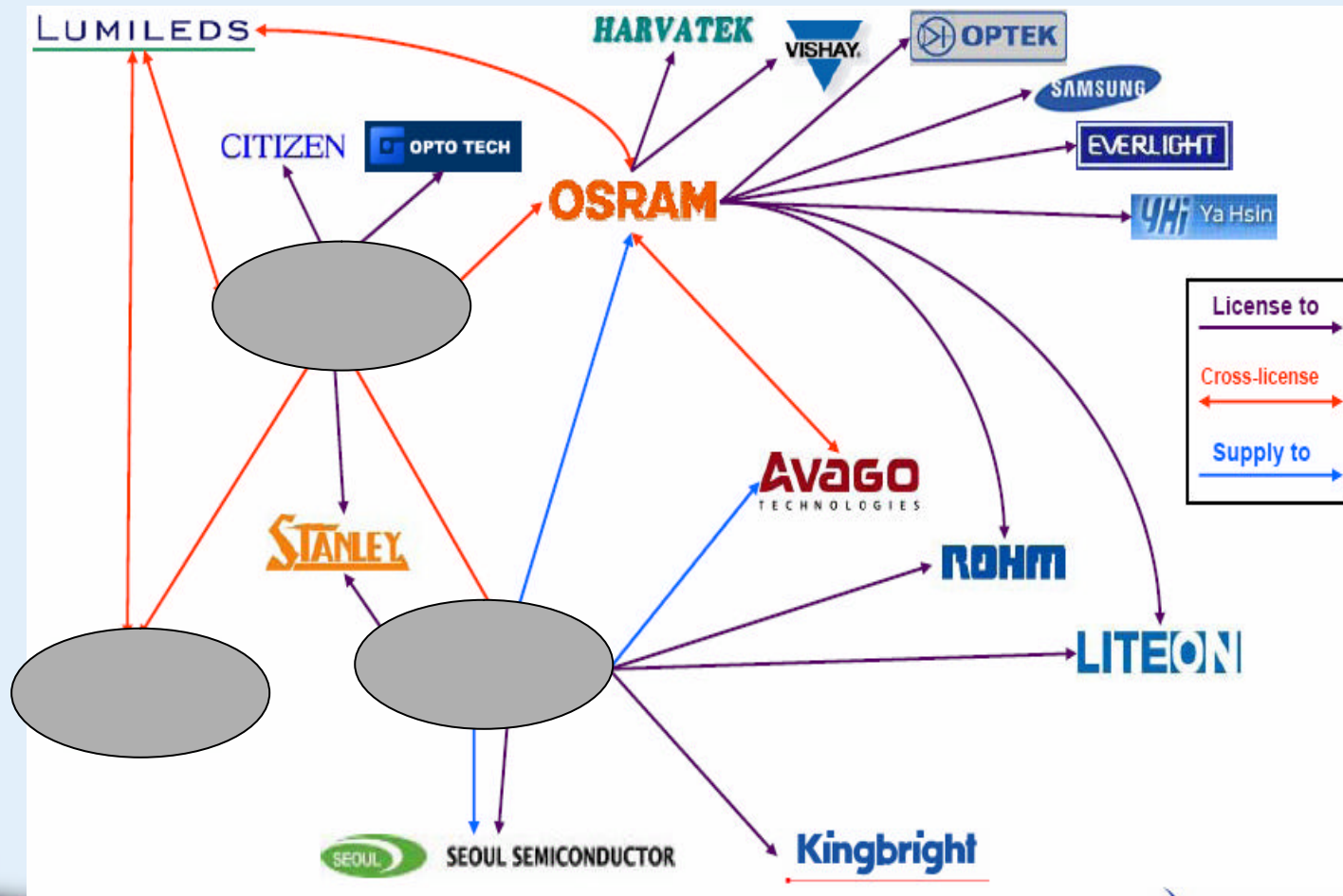
HB LED vertical supply chain



HB-LED 2006 market shares in revenues per company (all colours, all materials)



BluGlass RPCVD technology works within the current competitive and complex IP licensing environment



Competitive landscape

BluGlass

Cost reduction benefits

~ 48% TCoO cost reduction wafer level

~ 10% at blue LED device level

Source: Wright, Williams & Kelly, USA

Aixtron (Germany) – **High** Market Share

Market Capitalisation ~ US\$ 430M

Veeco (USA) – **High** Market Share

Market Capitalisation ~ US\$ 630M

EMF (Ireland) - **Medium** Market Share

Unlisted

RPCVD Process

Remote Plasma Chemical Vapour
Deposition: BluGlass' patented
technology

MOCVD Process

Metal Organic Chemical Vapour
Deposition: existing technology

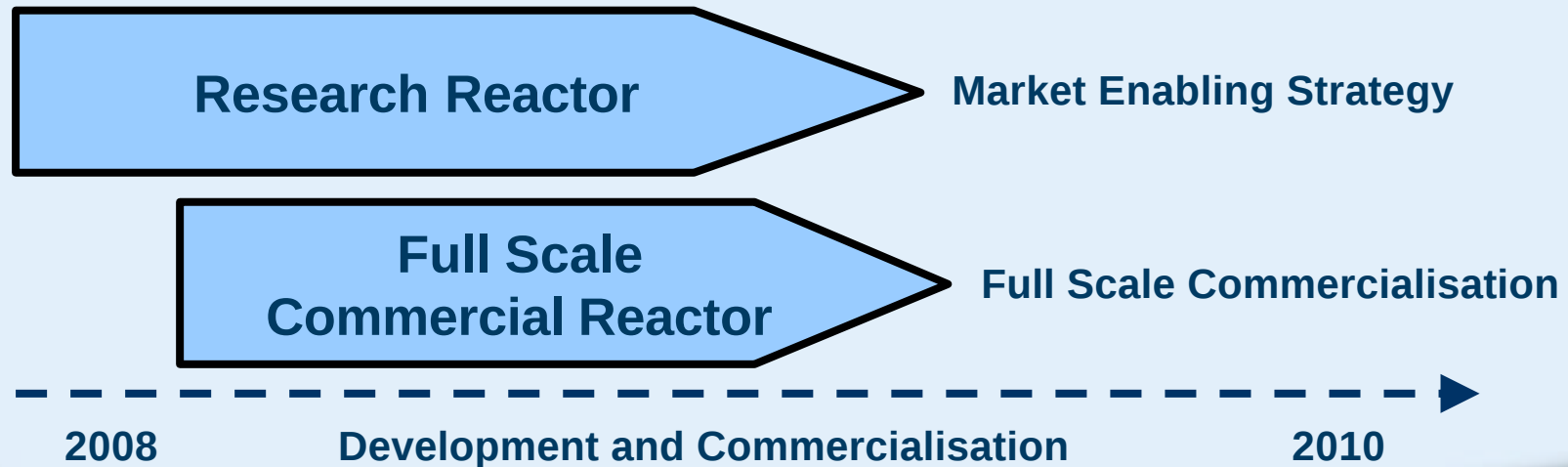
Low cost wafer manufacture

Higher cost wafer manufacture

BluGlass strategy

To demonstrate and deliver a low cost GaN manufacturing technology to the global market by:

- Supply of commercial equipment
- Process licensing (technology fee & royalty stream)
- Supply of specialised materials, and
- Niche manufactured product



Revenue model – example calculations

Revenue Model – 3 key drivers

1. Market Size – forward projection in \$'M and substrate requirement
2. Share – BluGlass share of that market
3. Return – BluGlass revenue on that share

Revenue model – example calculations

1. Market Size – forward projection in substrate requirement / \$'M

Yole Développement, Market Report, 2007, *“GaN’07 – New perspectives for nitride materials and devices”*

- Substrate Requirements – 2” sapphire / SiC equivalent
 - 2007 – 5.07 M
 - 2012 – 11.6 M
- Revenue US\$ GaN HB-LED
 - \$3.5 BN (2007) => \$7.5 BN (2012)

Revenue model – example calculation

1. **Market Size** – forward projection in substrate requirement

- **Substrate Requirement** – 2” sapphire / SiC equivalent
 - 5.1 M (2007) => 11.6 M (2012)
- **Wafer Production per Tool** – estimates & assumptions
 - Typical Reactor Capacity - 20 x 2” substrates
 - Runs / Day - 3 to 4
 - Work Days / Year – >350 plus
 - Production Yield - >80%
 - >20,000 epi-wafers pa
- **Reactor Demand Requirement -**
 - 2007 - 5.1M substrates
 - 2008 - 5.9M substrates => additional 0.8M substrates / ~ 40 additional reactors
 - 2009 - 7.0M substrates => additional 1.1M substrates / ~ 55 additional reactors
 - etc etc

Revenue model – example calculation

2. Share – BluGlass market share

- **Global Reactor Requirement** – from before, based on Yole substrate demand projections.
- **BluGlass Share** – a key driver

Revenue model – example calculation

3. Return – BluGlass revenue on market share; estimates / assumptions

A. 25% Rule of Thumb (Goldsheider *et al*)

- **Royalty as % of Cost Saving Offered** – Wright Williams & Kelly TCoO model (>40%)

✓	MOCVD MQW 2" sapphire LED epi-wafer –	< US\$90
✓	RPCVD MQW LED 2" glass epi-wafer -	< US\$50
✓	WWK Saving Modeled / Royalty Applied -	~ US\$40 / 25%

B. % of (Reduced) Wafer Production Cost

- Example royalty % of reduced COGS offered
- US\$50 / #%

C. % of Wafer Selling Price

- Example royalty on sell price
- US\$Y / #%

Revenue estimate – example calculations

➤ Revenue

- Clearly a rapidly growing market with strong revenue potential for the low cost BluGlass RPCVD technology

➤ Additional Potential Benefits Offered (but not yet factored in)

- Large area substrate (6"+) deposition –
 - significantly higher chip count per wafer (~ 9x, 9,000 => 80,000)
 - improved yield potential
 - reduced downstream processing cost
 - availability of lower cost / readily available substrates
- Other substrate types / processes (silicon)
- Other technology areas (III – nitrides / other)

Recent achievements and next milestones

- ☒ Dedicated manufacturing facility 1,260m²
 - ☐ Upgrade to electricity supply and fit-out in readiness to install RPCVD fabrication equipment **March 2008**
- ☒ Demonstrated world's first GaN-on-glass blue LED
- ☒ Extended GaN deposition wafer size from 2 inch to 6 inch
- ☒ Key collaborations enabling the technology's commercial demonstration are in place:
 - St Gobain Recherche, France (for special substrates)
 - EMF Semiconductor Systems, Ireland and Brooks Automation Inc, USA (for components of the commercial RPCVD reactor) 2Q07
 - M+W Zander, Germany (for cleanroom and machine shop design & manufacture) 4Q06
- ☒ Reactor chamber large scale tool passes rigorous testing
 - ☐ Incorporate into demonstration production line **March 2008**

Why invest in BluGlass

- LED sector is emerging as next “star” industry
- BluGlass is well positioned to enter this rapidly growing, US\$6B+ market with its breakthrough low cost technology
- Well funded – IPO + Comm Ready \$5M (no requirement for further funding)
- The RPCVD process has multiple benefits over existing technologies
- Strong IP position underpins commercial attractiveness
- Environmental and commercial benefits in adopting the technology
- Highly capable international technical and commercial team

Thank you

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