OLED Lighting Markets 2014

Nano-721

NanoMarkets

May 2014

OBJECTIVES AND SCOPE OF THIS REPORT

The main objective of this report is to provide a comprehensive overview of the OLED lighting market, thus assessing the future potential and to provide detailed eight-year forecasts for the OLED lighting business by segregating the market under different segments with separate revenue and volume estimations.

In compiling our forecasts, we examine the product development and marketing strategies of the leading and influential players in the OLED lighting sector, including both large and small lighting firms and the key OLED material suppliers.

We also take into consideration announcements by current and prospective players in the OLED lighting space regarding pricing, product types, capacity, and production timetables. These announcements are reviewed critically, because, in some cases, the expectations/projections of some players seem highly unrealistic to us.

Applications for OLED lighting covered by this report include:

- Designer kits and related products
- Luxury lighting
- Decorative and large-scale installations
- Residential OLED lighting
- Office lighting and other commercial lighting applications, and
- Automotive applications for OLED lighting

METHODOLOGY AND INFORMATION SOURCES

This report is the latest from NanoMarkets that looks closely at the trends in OLED lighting.

The basic forecasting approach is to identify and quantify the underlying addressable lighting markets for OLED lighting panels over the next eight years, and then to assess and quantify the potential for OLED lighting to actually penetrate these markets via substitution for LED lighting—a key factor in any forecast, because OLEDs represent a completely new form of lighting that will not replace existing light bulbs and tubes on a one-to-one basis.

As part of the analysis, we also assess the competitive landscape in order to determine the likely level of competition from other lighting technologies in the different addressable markets. And, we consider how technical developments in OLED lighting can accelerate, slow, or, in some cases, halt the ability of this technology to gain widespread commercialization.

To determine where the opportunities lie, we have based this report on both primary and secondary research.

Primary information is gathered largely through NanoMarkets' analysis of relevant applications markets and market trends based on ongoing discussions with key players in the OLED lighting segment, including entrepreneurs, business development and marketing managers, and technologists.

Secondary research is drawn from the technical literature, relevant company websites, trade journals and press articles, and various collateral items from trade shows and conferences. This research also includes the complete library of our own reports in this field, which is now quite extensive. Where data has been used from another report, it has been reinvestigated, reanalyzed, and reconsidered in light of current information and updated accordingly.

This report is international in scope. The forecasts here are worldwide forecasts and we have not been geographically selective in the firms that we have covered in this report or interviewed in order to collect information.

PLAN OF THIS REPORT

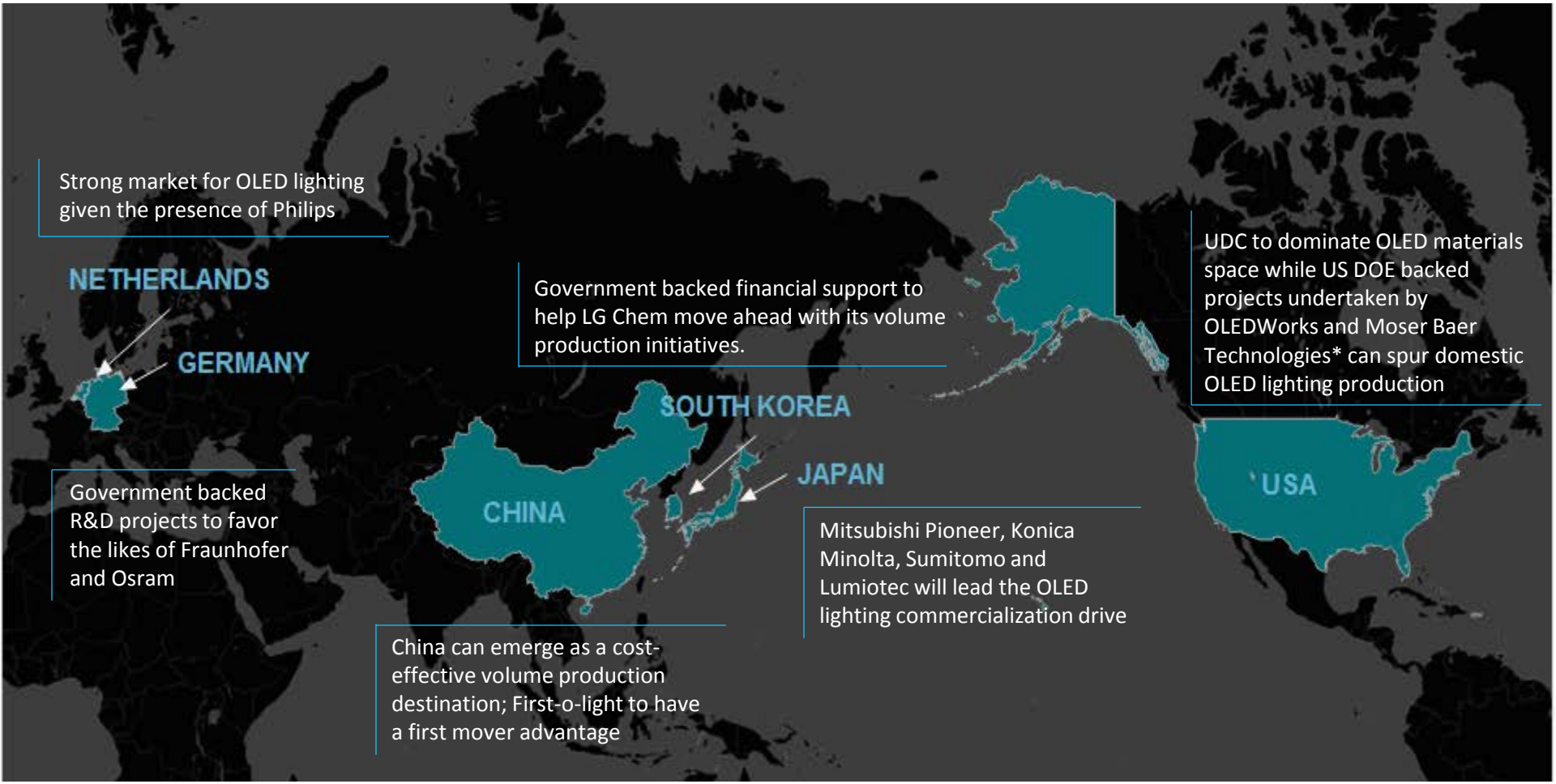
In Chapter Two of this report, we review the technological challenges that need to be ironed out to make room for large-scale commercialization of OLED lighting. We look at how the performance specifications and standards are evolving, as well as demand-side challenges such as reducing cost and creating a market-pull for OLED lighting. Special emphasis has been put on the discussion behind the need for a cost-effective manufacturing technique that can eventually reduce retail prices in the coming years.

Finally, in Chapter Three we review the addressable markets with the goal of identifying where and how OLED lighting is most likely to have commercial success. We focus on those firms that are actively involved in developing strategies to improve the performance parameters of OLED panels and those that have the potential to commercialize the technology in a big way. For this purpose, we have considered both OLED panel and luminaire manufacturers and OLED material manufacturers.

At the same time, we provide the core forecasts for OLED lighting on an application-by-application basis, and forecasts are given for the two main scenarios—the low-growth scenario in which OLED lighting remains as a luxury application and the scenario in which OLED lighting breaks into mass-market applications. We describe assumptions about pricing, market trends, and other factors that may influence the forecasts. The forecasts are broken out by application type and by product type (OLED panel vs. luminaire).

Chapter One: Introduction

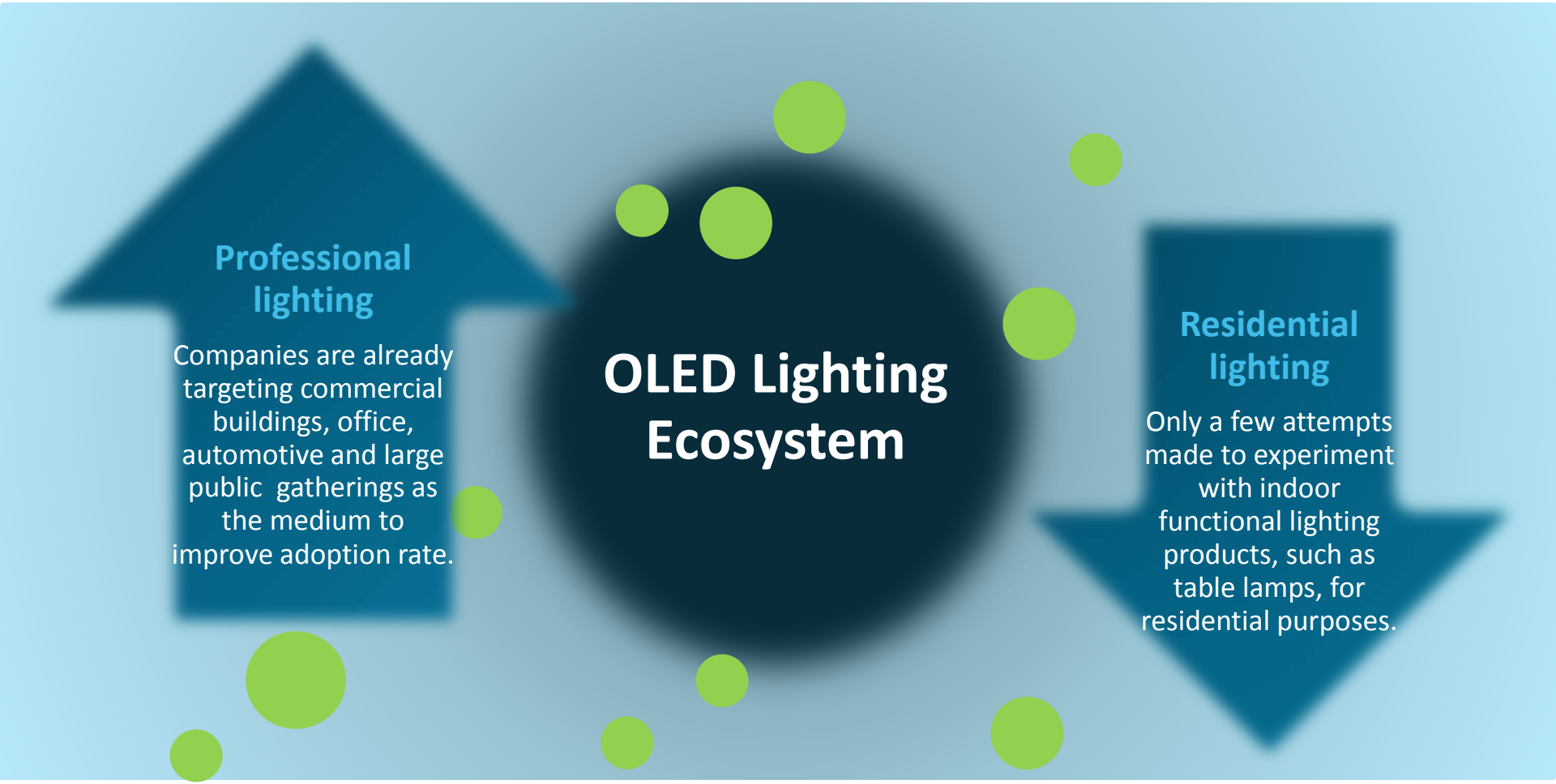
GLOBAL PRESENCE OF THE OLED LIGHTING INDUSTRY



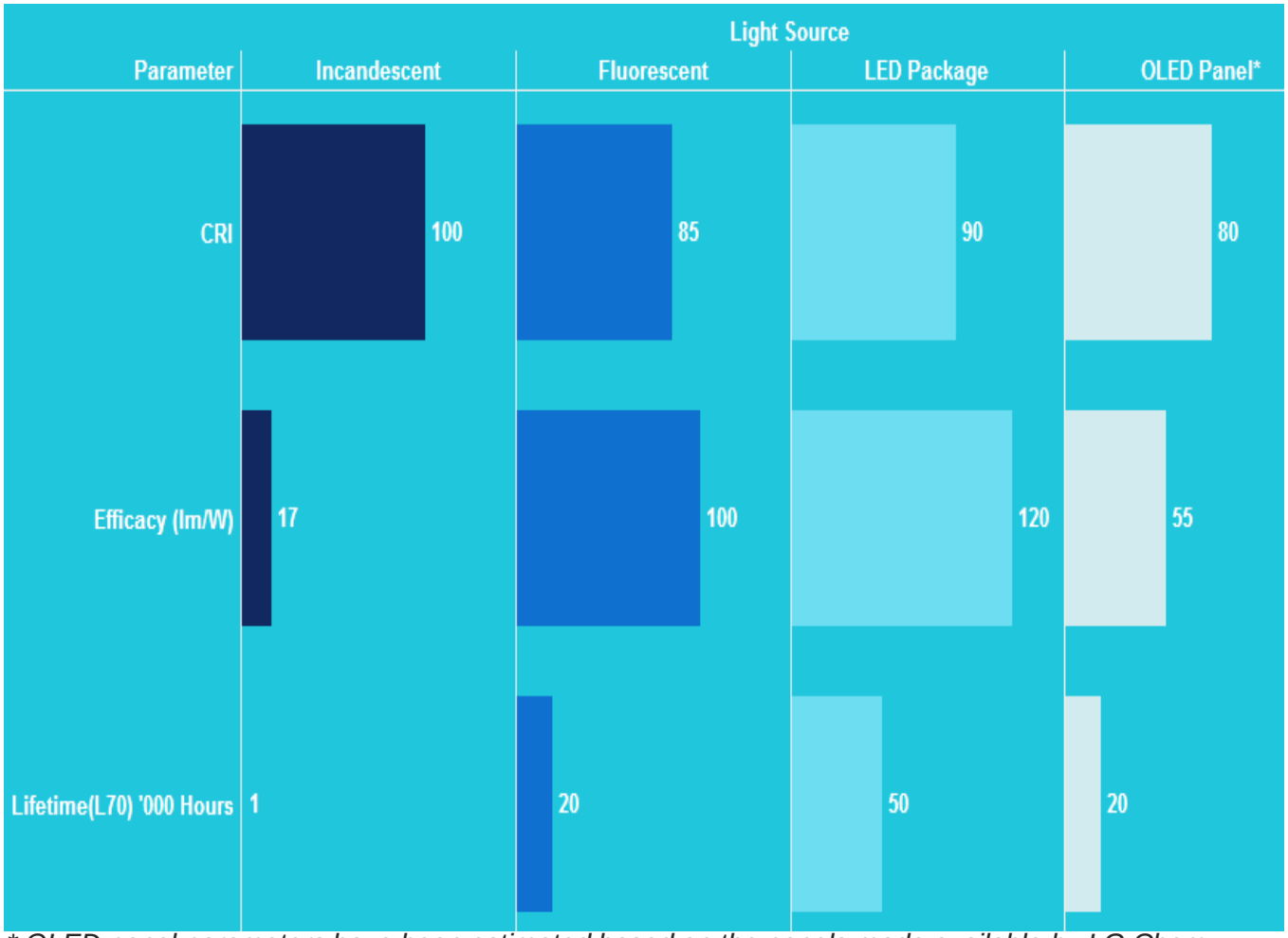
** A US subsidiary of Moser Baer India Ltd.*

The addressable market for OLED lighting panels can easily surpass the $1 billion mark by 2021 from the current market that is worth a couple of million dollars.

COMMERCIAL APPLICATION TRENDS



PERFORMANCE COMPARISON : KEY PARAMETERS



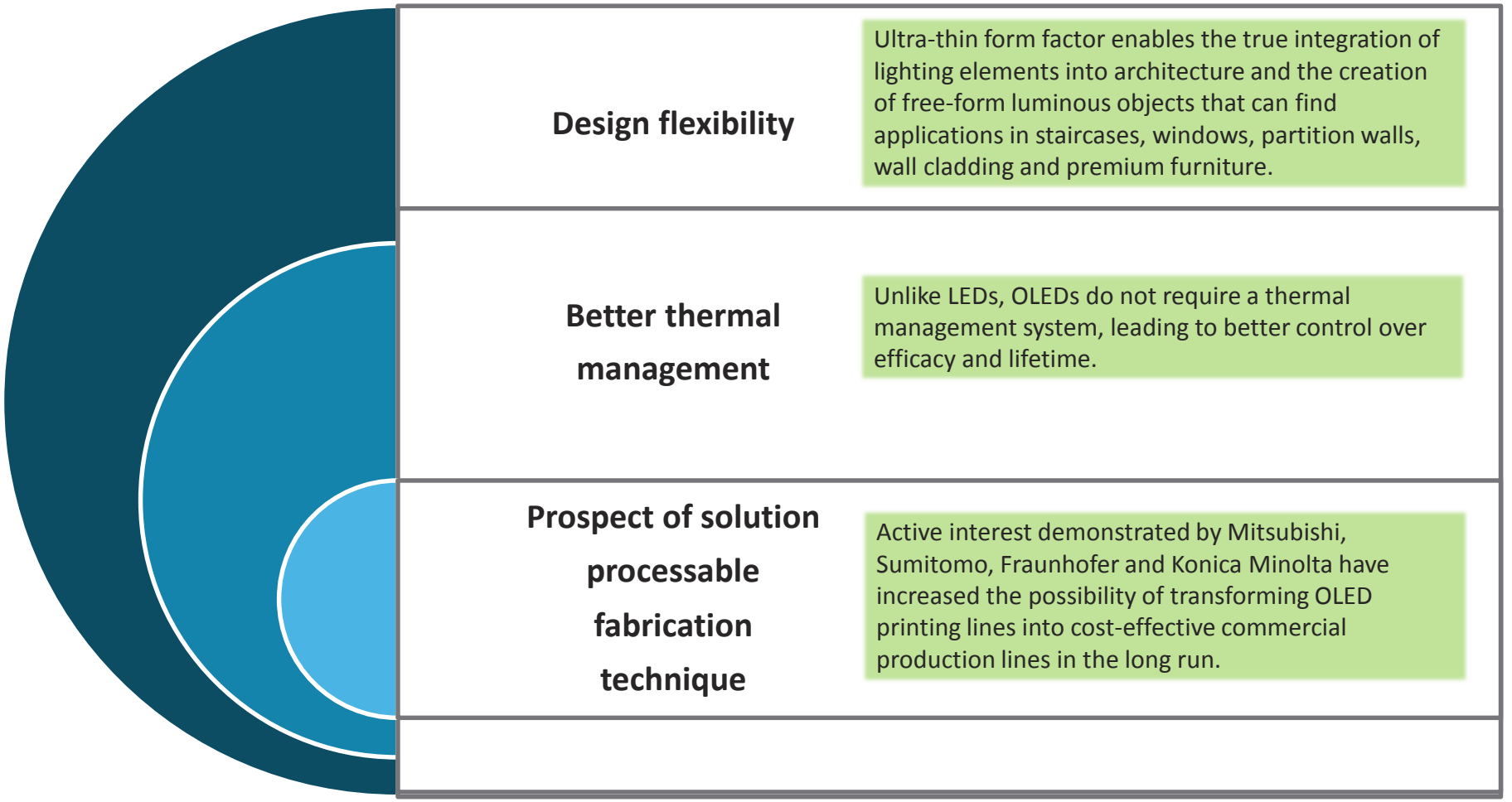
** OLED panel parameters have been estimated based on the panels made available by LG Chem*

The ability of OLEDs to offer numerous designing capabilities can offset, to an extent, the requirement for improvement of lifetime and efficacy in premium applications.

While OLED lighting players have started offering premium solutions, there is room for enhancing material characteristics (such as stable blue emitters) and fabrication techniques (such as continuous roll-to-roll processing.)

On a broader horizon, the current performance of OLEDs is comparable with LEDs, making OLEDs a suitable substitute for a wide range of lighting applications. However, it is the premium cost of OLEDs that must be brought down to cater to the mass market.

FAVORABLE FACTORS FOR THE INDUSTRY



KEY ISSUES FACED BY THE INDUSTRY

Cost-effective production scalability quickly

A critical challenge to tackle while ensuring performance parameters on a large scale; already proved to be a dampener with Panasonic Idemitsu and GE deciding not to move ahead with their OLED lighting initiatives.

Improvement of electrical efficiency

Although lumen depreciation process can be slowed down, this can lead to complexity in manufacturing process, rising costs and lowering yields. Novaled and Toshiba are the firms to watch for further developments in this space.

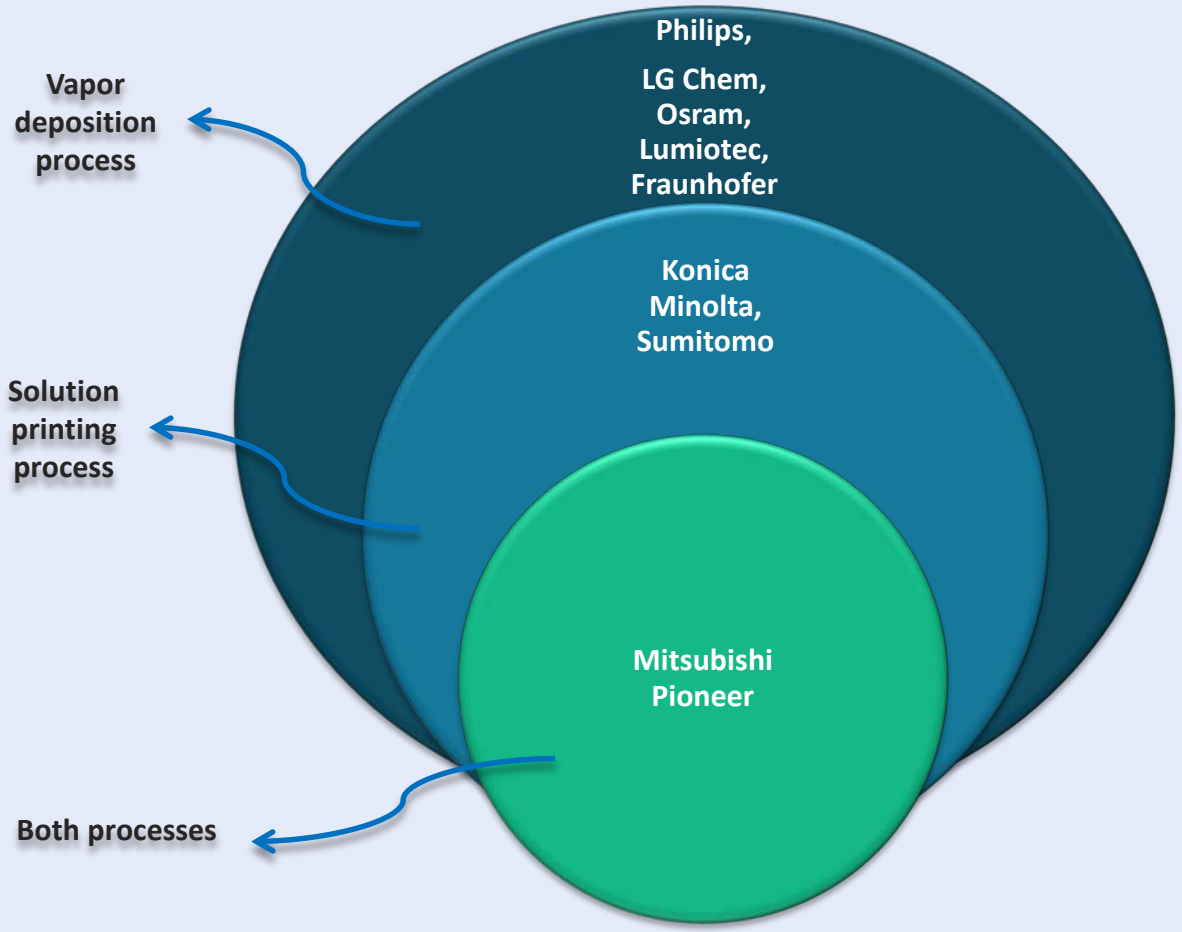
Better control of internal quantum efficiency

Despite research around phosphorescent materials, producing stable blue emitters with high quantum efficiency has been difficult, making it a weak link on the materials front. Konica Minolta and UDC are the key players to watch here.

Improvement of external quantum efficiency

Need to improve light extraction efficiency from the current level of 20-25% by optimizing the mismatch of refractive index of organic material, underlying substrate and air. LG Chem and Novaled are the noteworthy players here.

TRENDS IN OLED MATERIAL DEPOSITION TECHNIQUES



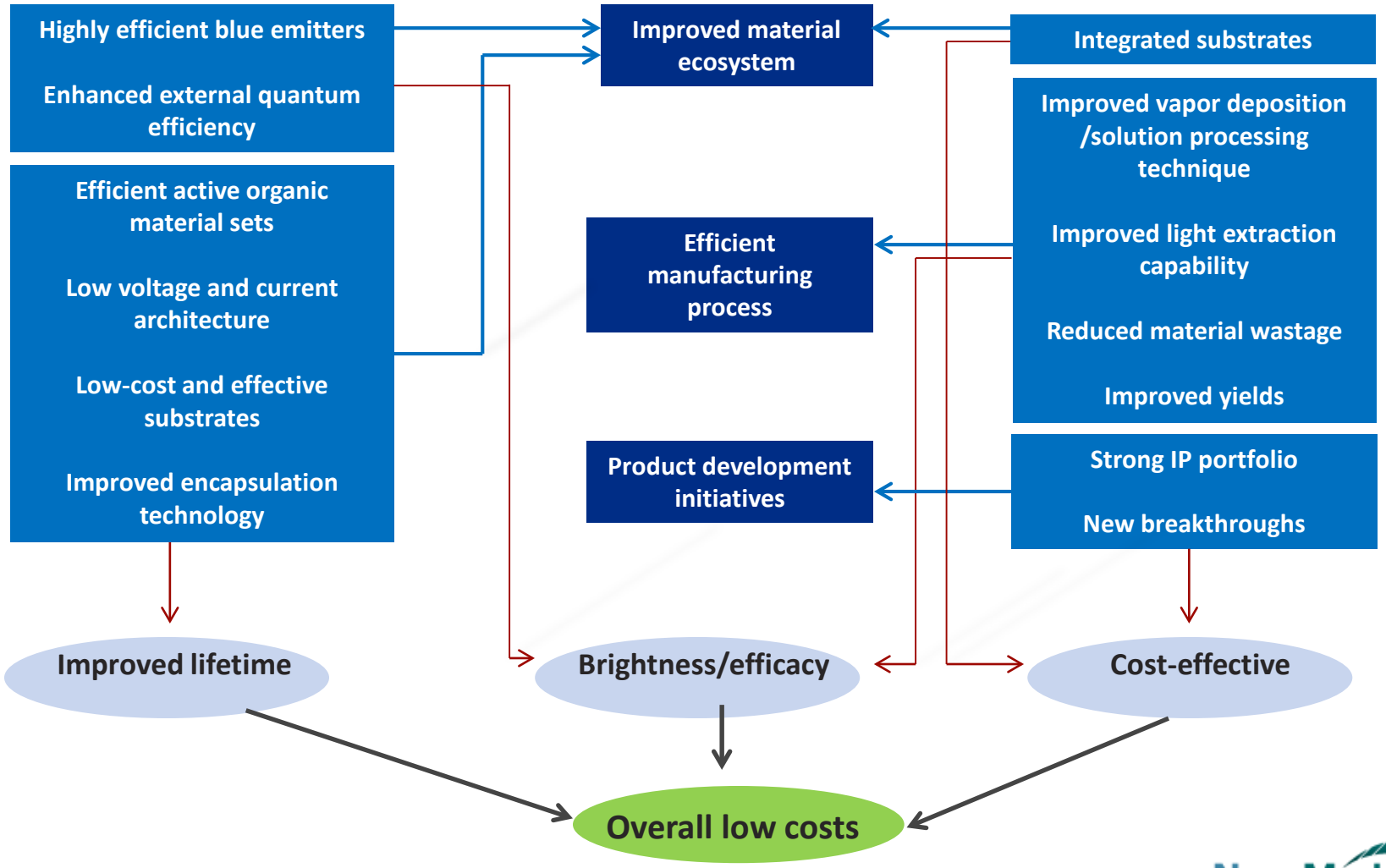
Majority of OLED players are still dependent on expensive vapor deposition technique and it will take the industry a few more years to adopt an efficient and cost-effective OLED material deposition technique.

It must be noted that solution-printing technique is yet to deliver the performance comparable to the currently utilized vapor deposition technique.

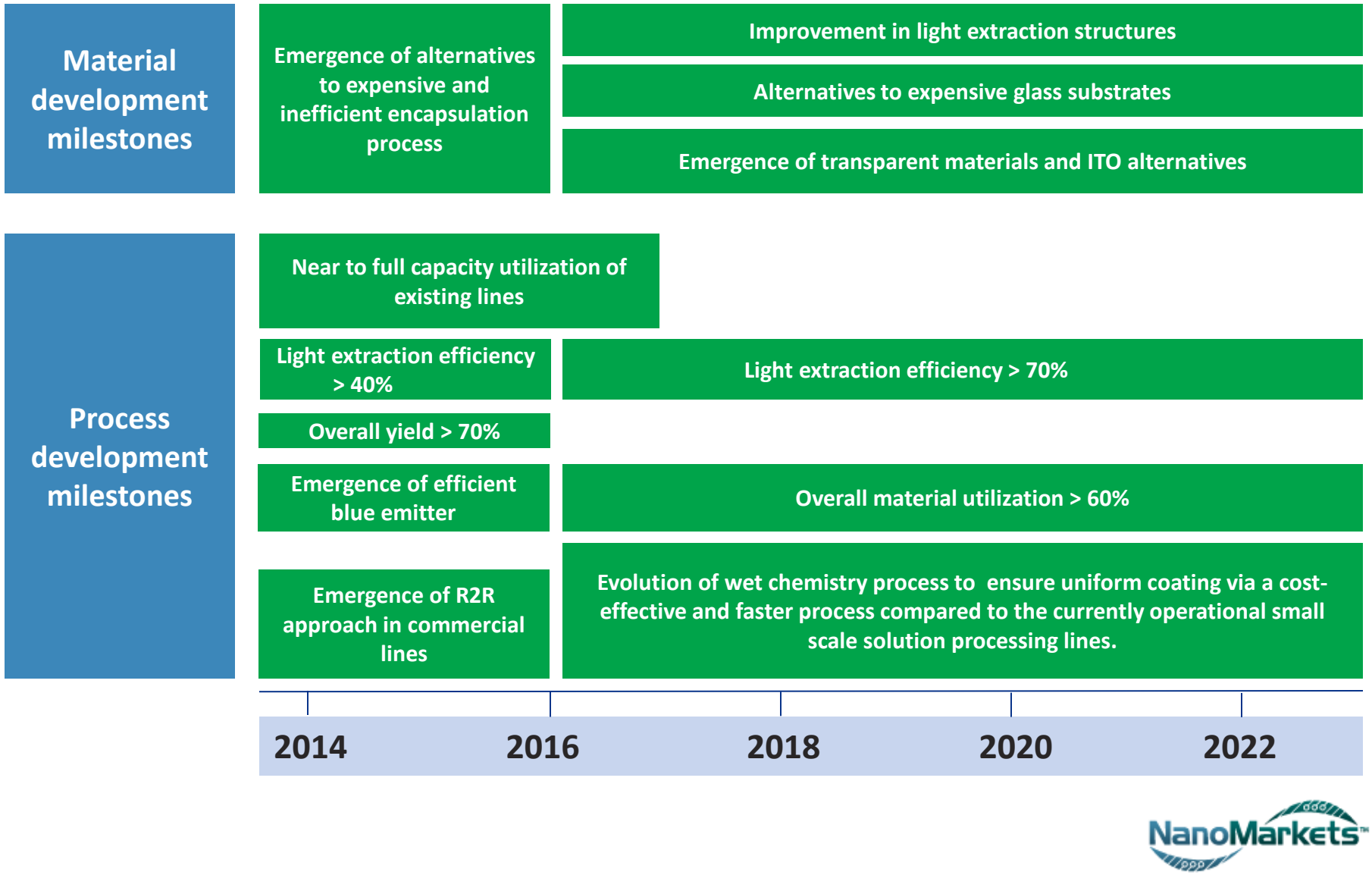
While nozzle printing techniques have been adapted to OLED displays by the likes of Du Pont and Dai Nippon, ink-jet printing techniques (IJT) have been experimented with for manufacturing OLED lighting panels.

This can be gauged by the fact that Sumitomo, one of the early adopters of IJT, is expected to roll out OLED lighting panels via IJT and utilizing its polymer based materials by 2015.

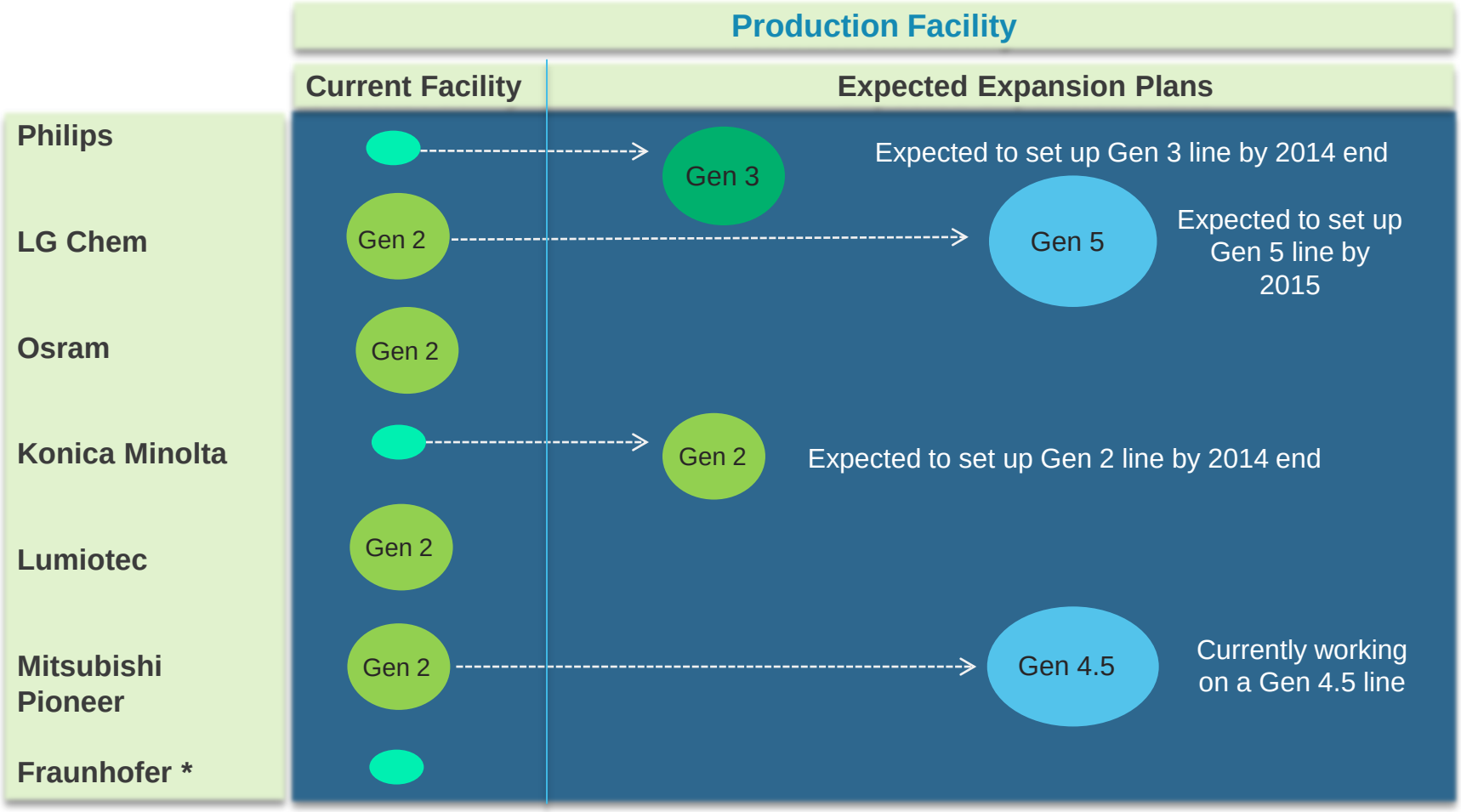
WAYS TO ACHIEVE COST REDUCTION TARGETS



MATERIAL AND PROCESS IMPROVEMENT TIMELINE



CURRENT PRODUCTION FACILITY OF KEY OLED LIGHTING PLAYERS



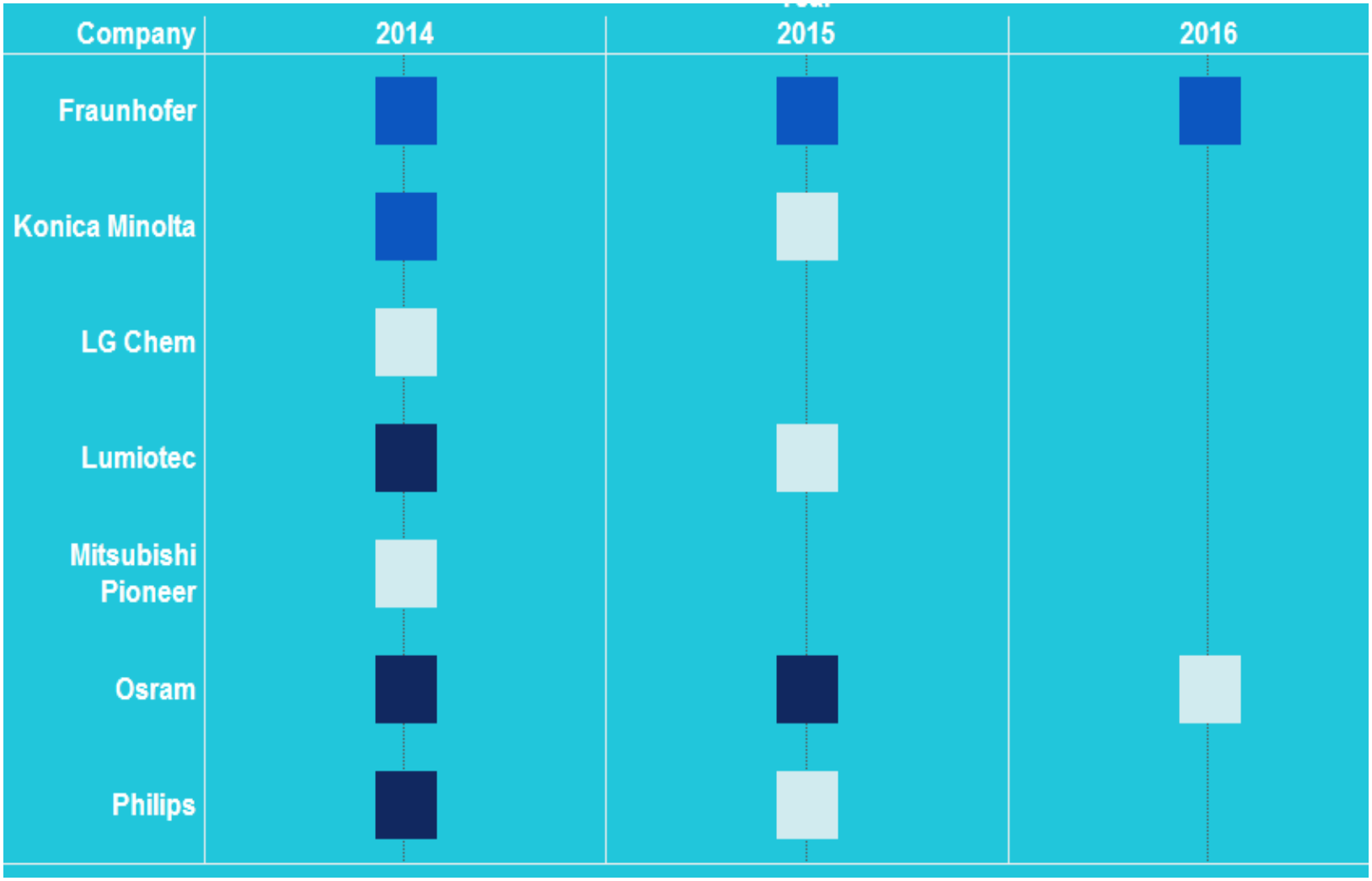
** Fraunhofer is an institute and not intend to make mass production. It may license its technology.*

Gen 2 lines are expected to enable the industry to commercialize OLED lighting applications; however Philips and LG Chem will remain at the forefront to migrate to larger substrate sizes in a move to take advantage of better material usage offered by higher generation lines.

STATUS OF COMMERCIAL AVAILABILITY OF OLED LIGHTING

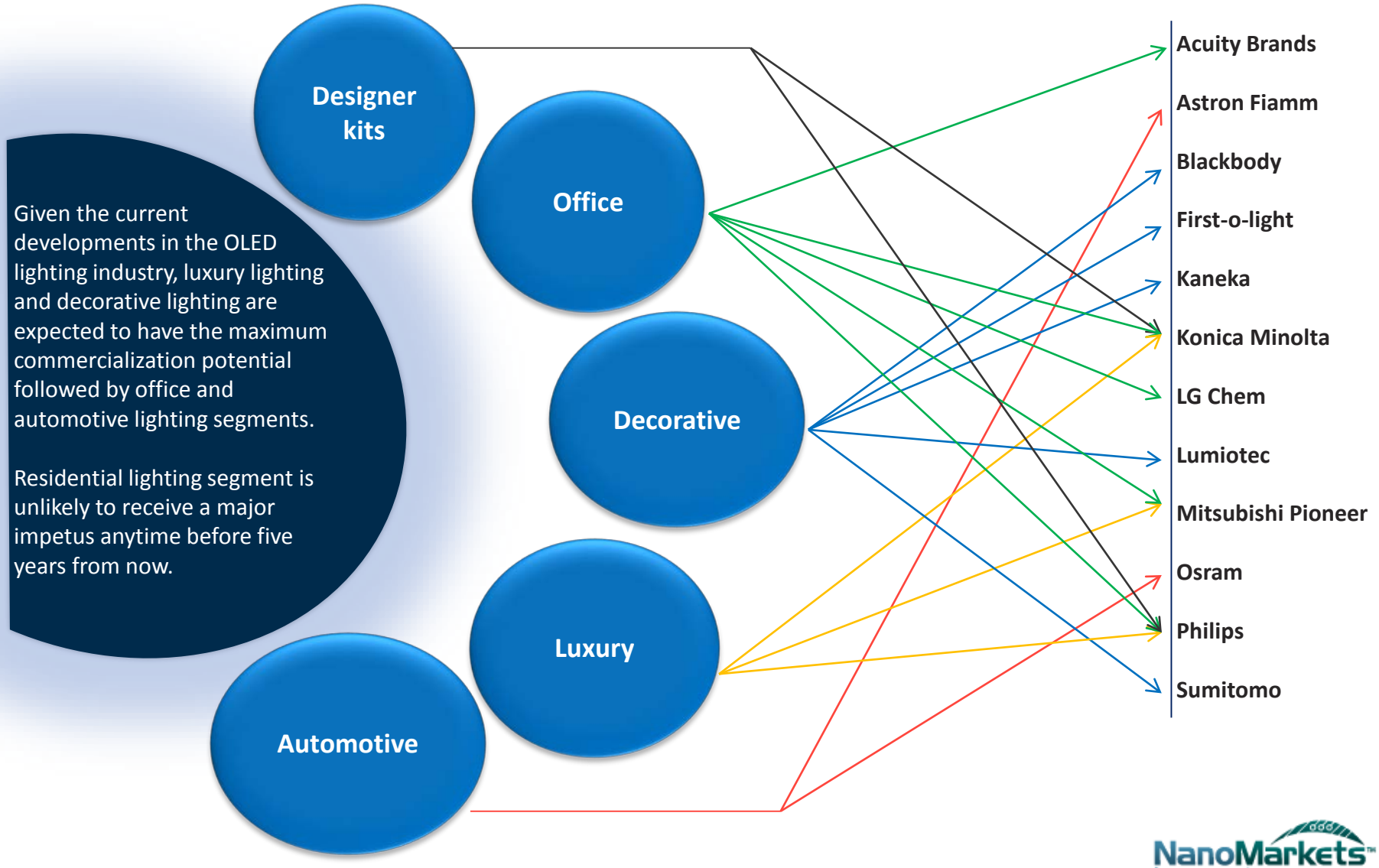
LG Chem and Mitsubishi Pioneer are expected to lead the OLED lighting mass production initiatives in 2014 with Konica Minolta likely to follow both firms in 2015.

Philips and Lumiotec likely to support additional commercial grade lighting panels from 2015 onward.



Note: Fraunhofer is an institute and not intend to make mass production. It may license its technology.

POTENTIAL APPLICATIONS



COMPANIES INVOLVED AND MAJOR INVESTMENTS

Konica Minolta (Japan)

Around $100 million investment to mass produce (by 2014 end) color-tunable and flexible panel with maximum monthly panel production capacity of around 1 million panels.

Big Value Investments - ***mainly within Asia***

LG Chem (South Korea)

LG Chem will also look at recouping its initial investment in migrating to a higher generation line by moving ahead with large scale production within the next three to five years.

While Osram is expected to channel its past OLED R&D investment to come up with automotive lighting solutions within the next two years, Philips will likely rely on the office and commercial lighting segment to reap benefits out of its €40 million investment in production line that started producing OLED lighting panels (early 2013) in addition to the already existing pilot line.

OLED LIGHTING INDUSTRY: PROBABLE MARKET SCENARIOS

Case 1: Domination of LEDs

OLED lighting finds only limited use in designer high-value applications in luxury set-ups.

LEDs manage to offer better aesthetic and performance possibilities at a relatively lower price point, thus undermining OLEDs.

OLED lighting industry struggles to improve lifetime and encapsulation issues, thus hindering volume production.

Primary OLED Winners

Material IP holders like UDC and LG Chem who can thwart the initial efforts extended by Osram and Philips, although these two companies can still cater to majority of the European market – a key high-value lighting destination. Others like Blackbody (France) can also be a winner by providing customized premium luminaires.

Case 2: Market Acceptance for OLEDs

The industry rides past production scalability issues and comes up with a cost-effective roll-to-roll process with an acceptable production yield and better material utilization levels.

Stable, efficient and long-lasting blue emitters are commercially developed on a large scale.

Large sized OLED lighting panels with a reasonably high brightness level (>5,000 cd/m2) are produced to cater to the residential segment.

Total cost of owning an OLED panel is made attractive as Japanese, Korean and Taiwanese manufacturers on government initiatives.

Primary OLED Winners

Dominance by material IP holders like UDC and Asian panel and luminaire makers with strong distribution channels; however the European market will witness an increased penetration of Philips and Osram that will look at leveraging their well-established network.

Most likely scenario to happen

Case 3: OLEDs Never Take Off

OLED lighting fails and is unable to take off in a significant manner even in premium commercial applications.

Possible due to the inability of the panel makers to standardize and make the material deposition and panel fabrication techniques cost-effective.

Wet-chemistry and roll-to-roll processes may also turn out unsuitable for large scale OLED panel production.

Lifetime issues of OLEDs might not get resolved as quickly as envisaged previously.

Encapsulation solution providers might also face difficulty in migrating toward a standard glass based alternative that is less expensive.

CONTACT US


facebook.com/pages/NanoMarkets/


twitter.com/nanomarkets


linkedin.com/in/nanomarkets


nanomarkets.net/rssfeeds

Address:
NanoMarkets, LC
PO Box 3840
Glen Allen, VA 23058

Telephone / Fax
804-270-1718
804-360-7259

Email / Web
info@nanomarkets.net
www.nanomarkets.net