

chapter 11

Electronics and Electrical

Chapter 11: Revitalising the Electronics and Electrical Sector

“The Electronics and Electrical sector has played a critical role in the development of an industrialised Malaysian economy, and I believe will continue to contribute significantly to the country’s GNI in 2020. Today, we have strong foundations and a deep base of companies. However, in the past decade, the sector has faced challenges in maintaining a strong growth trajectory. We now need to be a strategic E&E centre for leading global E&E players and domestic champions, offering high value for money and with a deep pool of talent. I am confident that the we can revitalise the sector and as the sponsor minister, I am personally committed to ensuring that the initiatives from these chapters are implemented and the ambitious GNI target is achieved.”

YB Dato’ Sri Mustapa B. Mohamed

“The Electronics and Electrical sector has the potential to bring highly-skilled jobs and a deep scientific and technological base to Malaysia. The sector would play a key role in building a sustainable innovation-driven Malaysian economy. This chapter sets out a clearly defined plan for doing so by deepening our capabilities across the E&E value chain in research and development, commercialisation and complex manufacturing. Upon adoption by the Government and provision of the necessary resources, I will ensure that the initiatives in this chapter are implemented and the GNI target is achieved.”

YB Datuk Seri Dr. Maximus Johnity Ongkili

The Electronics and Electrical sector (E&E) is an important contributor to Malaysia's economy, which in 2009 accounted for 6 percent of Malaysia's gross national income (GNI), 522,000 jobs and 41 percent of Malaysia's total exports. Today, most global E&E leaders have operations in Malaysia, and the sector has spawned local firms such as Silterra, IRIS, Tenaga Switchgear, DSEM and Pensonic. The E&E industry has also played a major role in the development of the Northern Corridor (semiconductors and industrial electronics), Klang Valley (sophisticated services), Johor (logistics intensive E&E manufacturing) and Sarawak (developing cluster for silicon substrate manufacturing).

Malaysian E&E has a strong foundation in semiconductors and industrial electronics. Virtually every leading global firm, from Intel to Texas Instruments, has semiconductor operations in Malaysia. In industrial electronics, Agilent, the global leader in test and measurement, produces significant percent of its electronic measurement equipment in Penang, and ABB, the global leader in automation and transmission and distribution, has its regional headquarters for its expanding markets (Middle East, Southeast Asia, South Asia) in the Klang Valley. In addition, there are emerging sectors growing globally at more than 20 percent a year, such as solar photovoltaic technology (solar) and light emitting diodes (LEDs), in which Malaysia already has a strong base of companies and is poised to capture global growth in manufacturing capacity.

Nonetheless, our E&E sector faces significant challenges in maintaining growth in the face of competition from China, Taiwan, Singapore and other Asian countries. Over the last 10 years, E&E's share of Malaysian exports has declined. Furthermore, Malaysia's focus in E&E has traditionally been on assembly, the lower value-added part of the industry, while countries like Taiwan, South Korea and Singapore have captured the higher value-added activities in research and development (R&D), design and manufacturing.

We will revitalise Malaysia's E&E sector to increase GNI to RM90 billion by 2020, provide an additional 157,000 jobs (both high skilled and medium skilled) and strengthen focus on four strong regional clusters (Northern Corridor, Klang Valley, Johor, and Sabah and Sarawak). Our focus will be on attracting leading multinational companies (MNCs) and creating Malaysian champions.

DEFINITION OF THE E&E NKEA

The E&E NKEA focuses on semiconductors, home appliances and industrial electronics as well as new technologies like solar and LED. Each of the sector's four regional clusters has its unique strengths and growth opportunities, on which we will build. The Northern Corridor has the most advanced semiconductor cluster and has a growing cluster of solar and LED manufacturers. Klang Valley, due to its proximity to Kuala Lumpur, is developing as a centre for creativity and services. Johor has the advantage of lower cost labour and proximity to Singapore (with opportunities for joint investments and training), as well as the world-class Port of Tanjung Pelepas. Sarawak offers high-grade silica and low-cost renewable power and can translate these two fundamental advantages to become a global centre for silicon substrate manufacturing. Sabah will also be further developed as its extensive agricultural-based profile supports the development of wireless sensor technologies, agricultural processing equipment and diagnostics tools.

MARKET ASSESSMENT

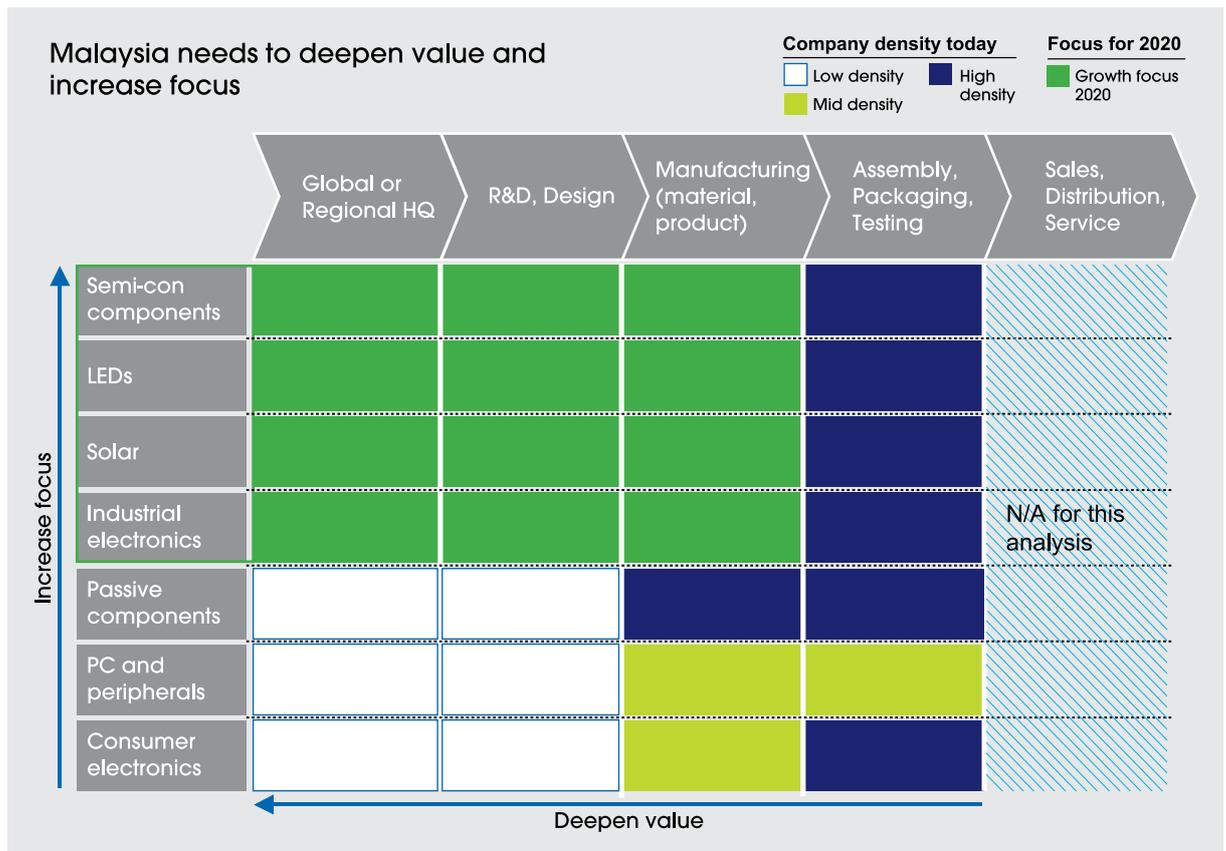
E&E is an important contributor to Malaysia's economy with exports in the range of RM250 billion in 2008. It employs more than half a million people, many in better paid skilled positions. With about 1,900 active companies, the sector has had many success stories, especially in the fields of semiconductors and industrial electronics. Malaysia is home to many of the largest and most successful companies in the field such as Intel, Agilent and Motorola and has incubated home-grown stars like Silterra, IRIS and Pensonic. It has a good start in the fast-growing sub-sectors of solar and light emitting diodes.

Critical challenges facing the sector have made it imperative to revitalise the E&E sector. The challenges include the following:

- **E&E's contribution to Malaysia's exports and its economy has been declining.** E&E's share of Malaysian exports increased dramatically during the 1970s and 1980s as Malaysia industrialised and introduced enabling policies such as free trade zones. However since 2000, E&E exports have grown more slowly than other exports (at 0.4 percent for E&E versus 7 percent for all exports), resulting in a decline in its share of exports from 59 percent in 2000 to 41 percent in 2009;
- **Malaysia's E&E sector is facing increasing competition.** China, which has emerged as the world's factory is a strong threat. A World Bank study shows the increase in export competition between Malaysia and China.¹ In 2007, 59 percent of Malaysia's exports to EU were under threat from China compared to only about 31 percent in 1990. Other emerging Asian economies such as Vietnam are fast becoming low-cost companies in the E&E industry, while at the high-end, Singapore and Taiwan compete for investments in higher-value activity;
- **Concentration of activity in assembly results in lower value added.** While Malaysia has built up significant clusters in E&E, much of the activity is in relatively low value-added assembly rather than higher value-added activities such as component manufacturing or R&D (*Exhibit 11-1*). Even within Penang's sophisticated semiconductor cluster, most of the activities are in assembly and testing rather than higher value wafer fabrication. As a result the value added per worker of about RM70 thousand is comparable to China and only a fifth of that of Singapore;

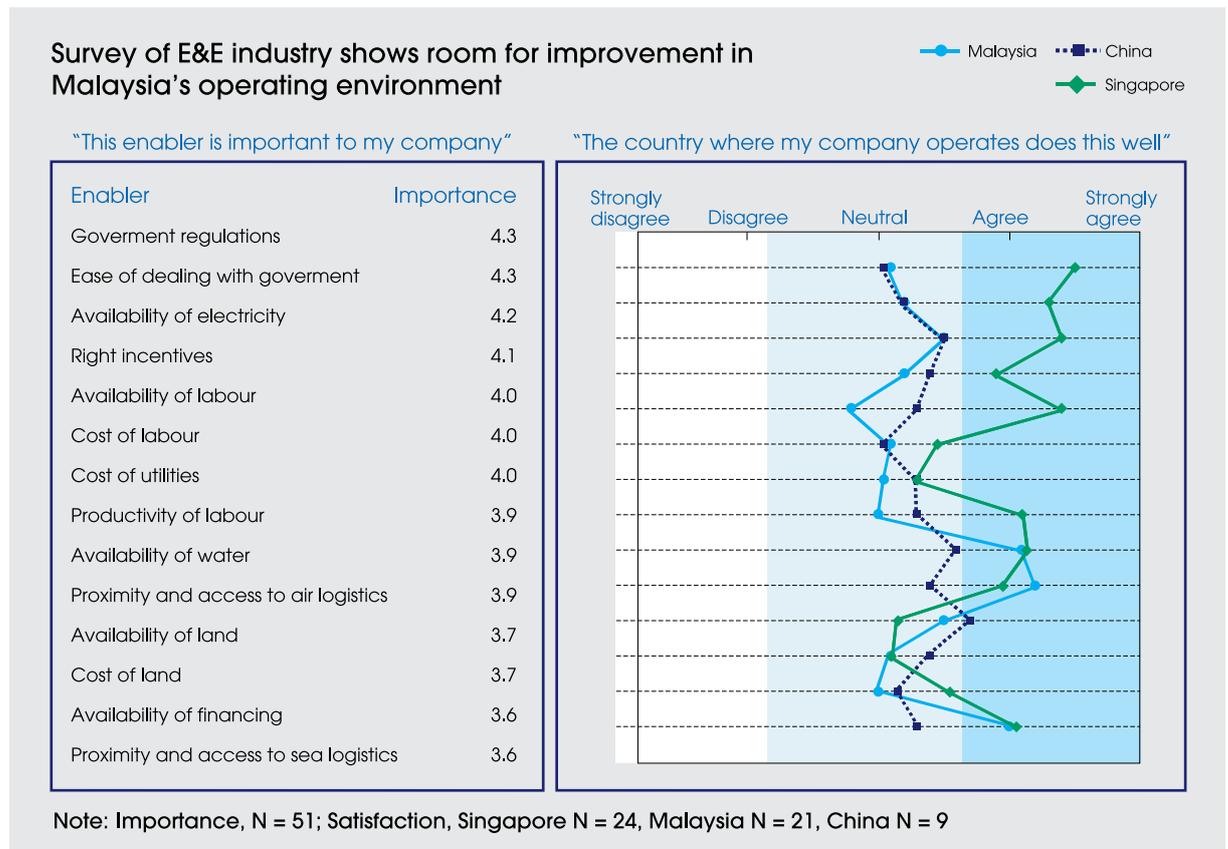
¹ "A comparative analysis of Malaysia's Industrial prospects and policy options", World Bank 2009

Exhibit 11-1



- **Malaysia’s capabilities in E&E are relatively unfocused across a range of sectors.**
 For example, we have a number of firms in so-called screwdriver PC and passive component assembly. Going forward, Malaysia should focus on sectors that are high-value and high-growth and in which it has existing strengths; and
- **Malaysia has significant room for improvement on almost all of the enablers important to industry players (Exhibit 11-2).** To avoid competing directly with countries like China by moving up the value chain, we need to ensure that Malaysia offers the right operating environment, mainly in availability of talent, infrastructure and Government facilitation as well as technical ecosystem.

Exhibit 11-2



TARGETS AND ASPIRATIONS

Our strategy is to focus on four target sub-sectors, chosen based on attractiveness in terms of growth and size (semiconductors, LEDs, solar and industrial electronics and home appliances) and four geographic clusters (Northern Corridor, Greater Klang Valley, Johor, and Sabah and Sarawak).

15 entry point projects (EPPs), business opportunities (including multiplier effect) and baseline growth will contribute RM90.1 billion to GNI (*Exhibit 11-3*), and 157,000 jobs by 2020.

15 EPPs, Business Opportunities and Baseline Growth to Deliver RM90.1 billion GNI by 2020

While there are 11 broad EPPs, some EPPs such as the Solar Upstream EPP span the entire value chain of the industry. To help provide a more granular level of detail on these important projects, we have articulated 15 detailed EPPs in this section. These EPPs cut across the four sub-sectors that will strengthen our capabilities across the value chain, particularly in higher value-added upstream activities:

Sector 1: Semiconductors

Semiconductors are an important part of Malaysia's E&E sector, but our efforts in this sub-sector have been typically in areas with lower value added such as test and assembly. The four EPPs follow a strategy of building on our strong foundations in the area of mature tech fabrication and expanding into advanced packaging and design of integrated circuits as well as supporting the growth of substrate manufacturers.

- **EPP 1:** Executing a smart follower strategy for mature technology fabrication;
- **EPP 2:** Developing assembly and test using advanced packaging technology;
- **EPP 3:** Developing integrated circuit design firms; and
- **EPP 4:** Supporting the growth of substrate manufacturers and related industries.

Sector 2: Solar

With a strong start in solar and solid experience in the similarly structured semiconductor industry, Malaysia has a promising future for a promising technology. By 2011, we will have the third largest solar market share in the world. A concerted effort to build broad solar production capacity coupled with our good location for the Asian market and low-cost labour force will allow us to leap into second place of a much larger industry by 2020.

- **EPP 5:** Increasing the number of silicon producers;
- **EPP 6:** Growing wafer and cell producers; and
- **EPP 7:** Increasing solar module producers.

Sector 3: Light emitting diodes

Malaysia has a strong lead in solid state lighting, one of the fastest growing segments of the light emitting diode industry. We need to move up the value chain from packing and testing to chip and application R&D by creating a cluster of international and domestic companies.

- **EPP 8:** Developing LED front-end operations;
- **EPP 9:** Expanding LED packaging and equipment; and
- **EPP 10:** Creating local solid state lighting champions.

Sector 4: Industrial electronics and home appliances

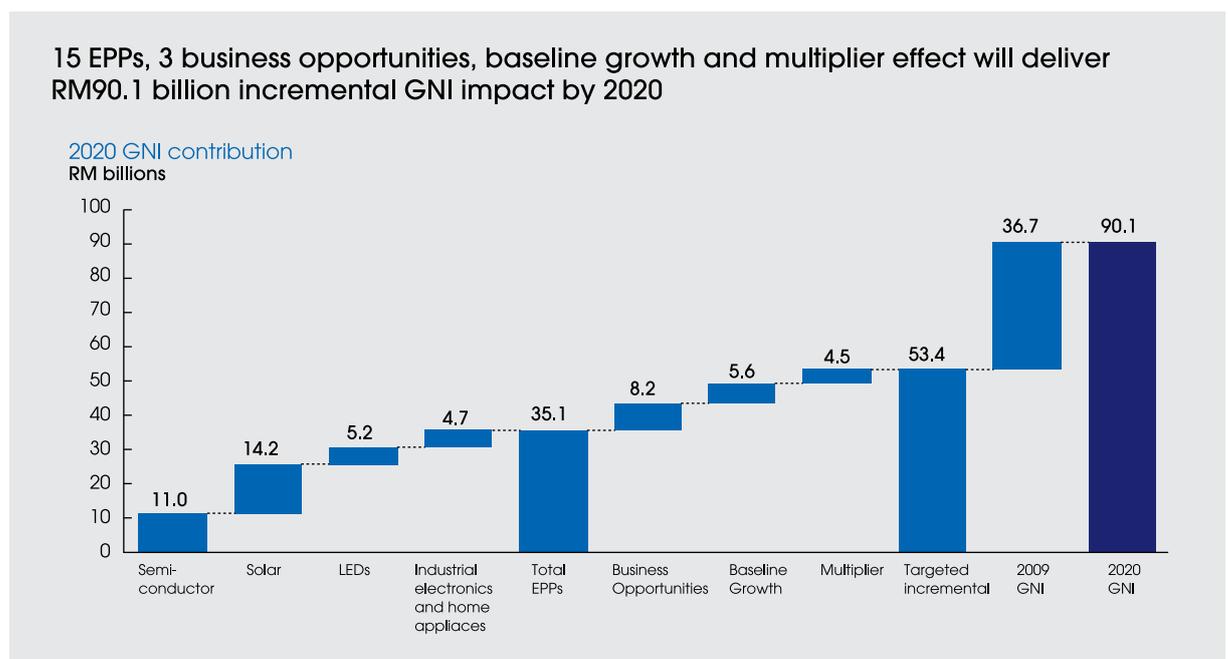
Industrial electronics comprises several sub-sectors involving the manufacturing of precision equipment used in industrial and commercial settings. Of these, the test and measurement, wireless communication, transmission and distribution and automation markets are the most attractive.

In addition, Malaysia has been successful domestically with local home appliance companies, most prominently Pensonic. The next step is to grow scale and build a strong international distribution network.

- **EPP 11:** Building a test and measurement hub;
- **EPP 12:** Expanding wireless communication and radio frequency identification (RFID);
- **EPP 13:** Growing automation equipment manufacturing;
- **EPP 14:** Building transmission and distribution companies; and
- **EPP 15:** Building a home appliance manufacturing hub and international distribution network.

The EPPs will contribute a combined RM35.1 billion to GNI by 2020. In addition, other business opportunities and baseline growth will contribute RM13.8 billion, with a further RM4.5 billion achieved from a multiplier effect from other NKEAs. The largest sources of the multiplier effect on the E&E NKEA are the Palm Oil NKEA (31 percent) and Wholesale and Retail NKEA (21 percent). This could be due, for example, to the potential increase in retail of computer and electrical products boosting production of semiconductors and LEDs. Growth in healthcare will also contribute to the multiplier with growth in medical devices.

Exhibit 11-3



SEMICONDUCTORS

These days, semiconductors are ubiquitous, providing the intelligence to power smart devices, from personal computers to cell phones. The worldwide semiconductor market is currently valued at RM812 billion (2009) and expected to grow at about 7 percent per year. The output value of semiconductors in Malaysia is around RM39 billion (2009), a global share of about 5 percent. As a large and high growth industry in which Malaysia already has a strong foundation, semiconductors are a key sector for E&E in Malaysia.

The semiconductor firms operating in Malaysia concentrate primarily on assembly and test.² There are relatively fewer higher value-added wafer fabrication plants³ or R&D units resulting in lower value added per worker and lower GNI.

Our goal for the semiconductor industry is to add RM11.04 billion in incremental GNI by 2020. Our share of global semiconductor final output value will remain constant at about 5 percent, but we will deepen the concentration of high value-added activity by moving beyond semiconductor assembly to create greater value.

EPP 1: Executing a Smart Follower Strategy for Mature Technology Fabrication

Rationale

Semiconductor fabrication plants (fabs) are high value-added manufacturing plants that anchor the entire semiconductor value chain (e.g. integrated circuit (IC) design and substrate manufacturing). Instead of pursuing a leading edge strategy for wafer fabs, we will pursue a smart follower strategy in which we target the establishment of fabs that use mature technology focused on niche applications.

We focus on fabs using mature technology because the leading-edge business is capital expenditure-intensive. Apart from market leaders (such as TSMC in foundries), many leading-edge fabs often make significant losses. This is because to remain on the leading edge, fabs need to continuously invest in R&D and new equipment (e.g. RM11 to 14 billion to build a new leading-edge fab). However, a set of smaller companies that focus on selected niche technologies (e.g. analogue, power) and use mature technology (defined as 90 nanometer or larger transistor feature size) are able to earn attractive returns, such as a return on assets of about 10 percent. In addition, apart from the most demanding logic, memory, graphics and field-programmable gate array applications, mature technology fabs are competitive in a wide range of applications accounting for 65 percent of world-wide semiconductor revenue. A strategy focused on niche mature technologies avoids crippling R&D and capital expenditures and offers longer term sustainability.

In addition, refurbished equipment provides an opportunity to equip a fab at a significantly lower cost. A mature technology fab using refurbished equipment can be built for an estimated cost of only RM1.8 billion, compared to RM11 to 18 billion for a leading-edge fab. The closure of fabs in high-cost countries provides an opportunity to acquire refurbished fab assets at a low cost. Refurbished equipment currently accounts for about 11 percent of equipment sales, and the global growth rate of sales of refurbished equipment is expected to be 18 percent per annum.

² Assembly and test refers to the packaging of semiconductors with electrical connectors, followed by testing

³ Fabrication plants etch nanoscale transistor features onto silicon wafers

Actions

The Malaysian Investment Development Authority (MIDA) will lead this EPP, supported by a fab consortium. A consortium has already been formed to acquire fab assets in high-cost countries and relocate the fab equipment to Malaysia. The consortium focuses on mature technology targeting specialised applications, and it has already signed a terms sheet with a foreign fab to acquire its assets and relocate the equipment. The first fab is planned to start operations in 2011, and there will be four more fabs built by 2020, which would double the number of fabs in Malaysia.

Three smaller wafer size fabs (200 millimetre) will be built first, followed by two larger wafer size fabs (300 millimetre). The timeline is to build a fab every year 2011 to 2015. MIDA and the fab consortium will work together for the success of the fabs.

Ministry of Science, Technology and Innovation (MOSTI), through Multimedia Development Corporation (MDeC), will provide technical support and advice.

Enablers

Funding for building the fab facilities is being sought, based on a build and lease strategy. MIDA is identifying suitable investors to fund this EPP.

Further, the Government will raise standards in key technology parks to meet the needs of semiconductor fabs. In general, power and water quality standards in Malaysia governing the utility providers are intended for general industrial use. The requirements for semiconductors, particularly for wafer fabs, are much more rigorous and governed by international standards such as SEMI F47-0706. Power quality challenges in the Kulim High Tech Park have affected semiconductor manufacturing operations.

Funding

The cumulative funding required from 2010 to 2020 is RM10.2 billion in private investment and RM0.1 billion in public investment.

Impact

The EPP will provide incremental GNI of RM4.2 billion and create 6,500 jobs.

EPP 2: Developing Assembly and Test Using Advanced Packaging Technology

Rationale

Despite Malaysia's large number of semiconductor assembly and test operations, only a few firms offer advanced packaging services like bumping or wafer level packaging. Malaysia is naturally positioned to extend its strong starting point as an assembly-and-test hub to become a hub for more advanced semiconductor packaging services. There is domestic demand for such advanced packaging services within Malaysia. For example, Silterra currently ships its chips to Taiwan for gold bumping. The success of the fab strategy will also drive domestic demand for more advanced packaging services.

Actions

The Northern Corridor Implementation Authority (NCIA) will lead this EPP, supported by MIDA. There are ongoing discussions with a company to bring an advanced packaging service to Malaysia, with financial assistance under negotiation with the Malaysian Government. The first bumping service in Malaysia will provide a success story that MIDA can use to attract more companies to offer more advanced packaging services (such as bumping and wafer level packaging) to be set up in Malaysia. We are targeting three companies by 2020, and hope to have all three secured by the end of 2012.

Enablers

NCIA and MIDA will provide Government support in the form of incentives (Pioneer Status incentives, Investment Tax Allowance) to pioneering groups to scale up the presence of advanced packaging lines in Malaysia.

They will also target assembly and test companies already in Malaysia to bring in advanced packaging lines.

The fab consortium and MIDA will work together to ensure the success of the fabs, as this will be an important source of demand for advanced packaging services.

Funding

The cumulative funding required from 2010 to 2020 is RM0.6 billion in private investment and RM0.3 billion in public investment, which will be in the form of incentives.

Impact

The EPP will provide incremental GNI of RM1.3 billion and create 1,300 jobs.

EPP 3: Developing Integrated Circuit Design Firms

Rationale

Malaysia has achieved some success as a design centre for ICs, with a mix of multinational IC design centres and domestic IC design companies. For example, Intel's Penang Design Centre has a history of nearly 20 years and has been involved in the design of leading-edge ICs for Intel. Nonetheless, with about 15 active IC design companies, the number in Malaysia is significantly smaller than the number in the USA, Taiwan and Europe. IC design firms require highly skilled employees who invent intellectual property (IP) and are thus aligned with Malaysia's goal of creating an innovation-driven and high income economy.

Actions

MIDA will lead this EPP, supported by NCIA, EPU, MOSTI (MDeC), Silterra and the fab consortium.

MIDA is in ongoing discussions with at least four IC design companies to set up in Malaysia, and our target is a total of 50 additional IC design companies by 2020. This would increase the number of design companies by about four-fold. In addition, we will seek to grow locally based IC design companies.

MIDA, Silterra and the fab consortium have committed to identifying and encouraging IC design companies to set up in Malaysia, which would provide a customer base for their fab services. Many of those targeted are expected to be existing customers of fabs acquired by the fab consortium. The value proposition we offer is that proximity to the fabs will provide for faster prototyping. Malaysia can also fill the niche for smaller design companies that wish to use fab services but are too small-scale to get served by large foundries such as TSMC or UMC.

MOSTI (through MDeC) will provide technical support and advice to ensure the design eco-system is established.

The target is to attract 10 IC design companies a year from 2011 to 2015, for a total of 50.

Enablers

Shared services and labs. NCIA will work to make electronic design automation tools, a prototyping lab and a test lab for certification and standards available for sharing.

NCIA and the Selangor Human Resource Development Council (SHRDC) will augment the availability of electronic design automation tools on a pay-per-use basis to increase the current low availability. This would lower the cost of starting up a local IC design company.

NCIA will facilitate the setup of a prototyping lab, so that local IC design firms can avoid the high cost of sending their prototype designs overseas for prototype production. MOSIS in the USA is a model of providing low cost fabrication services to universities and companies.

Lastly, NCIA will facilitate the establishment of a shared test lab for targeted certification and standards such as the requirement that RF chips used in the USA and Japan require FCC and Telec certification. This lab will be established under the existing NCIA Centre of Excellence (CoE) for E&E. The shared test lab would include a certification authority similar to labs in Taiwan, Japan and Australia.

Financing and incentives. EPU will enhance financial support to the Skills Development Centres (SDC) (e.g. Penang SDC, Selangor HRDC) to train talent in IC and embedded design. MIDA will provide Government incentives for multinational companies to outsource IC design to Malaysian IC design companies.

Promotion. MIDA will launch specific missions with pre-approved incentives to target IC design firms.

Infrastructure. Masterplan Batu Kawan in Penang, which is being developed, will be designated a hub for high value E&E including IC design services. More detail is provided in the Northern Corridor section.

There is also a requirement for faster and cheaper broadband services, which is critical for transmitting large IC design documents, especially in the Northern Corridor. Broadband issues are addressed by the Communications Content and Infrastructure NKEA.

Funding

The cumulative funding required from 2010 to 2020 is RM0.6 billion in private investment and RM0.3 billion in public investment.

Impact

The EPP will provide incremental GNI of RM3.2 billion and create 2,000 jobs.

EPP 4: Supporting the Growth of Substrate Manufacturers and Related Industries

Rationale

Malaysia is already a manufacturing location for leading wafer substrate manufacturers Shin Etsu and MEMC, which are number one and four in world market share respectively. The growth of the core semiconductor value chain would increase Malaysia's attractiveness as a site for substrate manufacturers. There are also adjacent industries, such as equipment and epitaxy manufacturers, that would grow as the core semiconductor value chain deepens. Together with the promotion of the growth of the core semiconductor value chain, we will also promote Malaysia as a location for adjacent industries that focus on substrates.

Sarawak is a good site for silicon wafer substrate manufacturing due to the availability of high quality silica and low cost power. The target is for one substrate plant in Sarawak by 2012 and a second plant by 2014.

Actions

MIDA will lead this EPP, supported by Sarawak Regional Economic Corridor Development Authority (RECODA). MIDA will target to bring in at least two more wafer substrate manufacturers to Malaysia, doubling the current number. Global leader manufacturers such as Sumco, Siltronic, LG-Siltron and Covalent and smaller companies will be targeted.

Enablers

We will improve the investment environment in Sarawak. For example, RECODA will expedite approvals for new substrate projects and reduce the process duration to maximum of two months. Further details follow in the key enablers Sarawak section.

MIDA will launch a targeted promotion to substrate manufacturers and other related industries to set up in Malaysia.

MOSTI will provide technical advice and support in R&D, technology platform and innovation. It will also identify basic research areas with universities and applied research areas with local and international research institutions.

Funding

The cumulative funding required from 2010 to 2020 is RM3.2 billion in private investment and RM0.2 billion in public investment.

Impact

The EPP will provide incremental GNI of RM2.6 billion and create 3,200 jobs.

Further enabling actions to support the semiconductor industry

Apart from the actions to support the EPPs above, there are enabling actions that support the semiconductor industry as a whole.

- Set up shared facilities and/or labs that can be used by the semiconductor industry for a fee, thereby lowering the cost of operations in Malaysia. Specifically, we need to set up a Board and System CoE, a Test Development CoE, a Material Science and Packing CoE, a Testing Lab for Wafers (metrology instrumentation), a Contactless Testing Lab and a Failure Analysis Lab (Public funding: RM224 million, Owner: MIMOS/EPU);
- Establish an IP block marketplace, led by the existing NCIA CoE for E&E. The availability of IP blocks can enable more complex designs to achieve faster time to market (Public funding: RM6.4 million, Owner: NCIA);
- Work with existing waste treatment companies to set up processing facilities near to industrial parks (Public funding: RM9.6 million, Owner: NCIA);
- Establish a centre for refurbishment, retrofitting and parts cleaning, which will consist of a local provider for these essential services (Public funding: RM8 million);
- Establish a semiconductor training centre to bridge the gap between the skills of fresh graduates and the requirements of the industry. (Public funding: RM8 million); and
- Encourage material suppliers (gas and specialty chemicals) to set up operations in Malaysia, which would result in cost and time savings for semiconductor firms here (Owner: MIDA).

SOLAR

The solar value chain has similar stages to the semiconductor value chain. It consists of: producing the silicon feedstock and silicon ingot; cutting the ingots into wafers; fabricating the silicon wafers into photosensitive cells; assembling complete solar modules; and the balance of systems, which refers to components other than the solar cells in a photovoltaic system such as wiring and racks. The similarity suggests that Malaysia can build on its capabilities in semiconductors to capture the global growth in the solar industry.

Due to current high costs, solar is not yet economically competitive with other energy sources like oil or coal, or even with other renewable energies like biomass or hydropower. While renewable energies now account for about 11 percent of global energy supply, solar only has a share of 0.6 percent of renewable energies and 0.01 percent of global annual energy supply.⁵

However, the solar market has grown very quickly. Between 2005 and 2010 the market grew at around 50 percent annually.⁶ In 2010, the global solar market will reach 10 gigawatts in annual supply and around RM160 billion in revenues.

⁵ Source: International Energy Outlook, EPIA, EREC-Renewable Energy Scenario to 2040

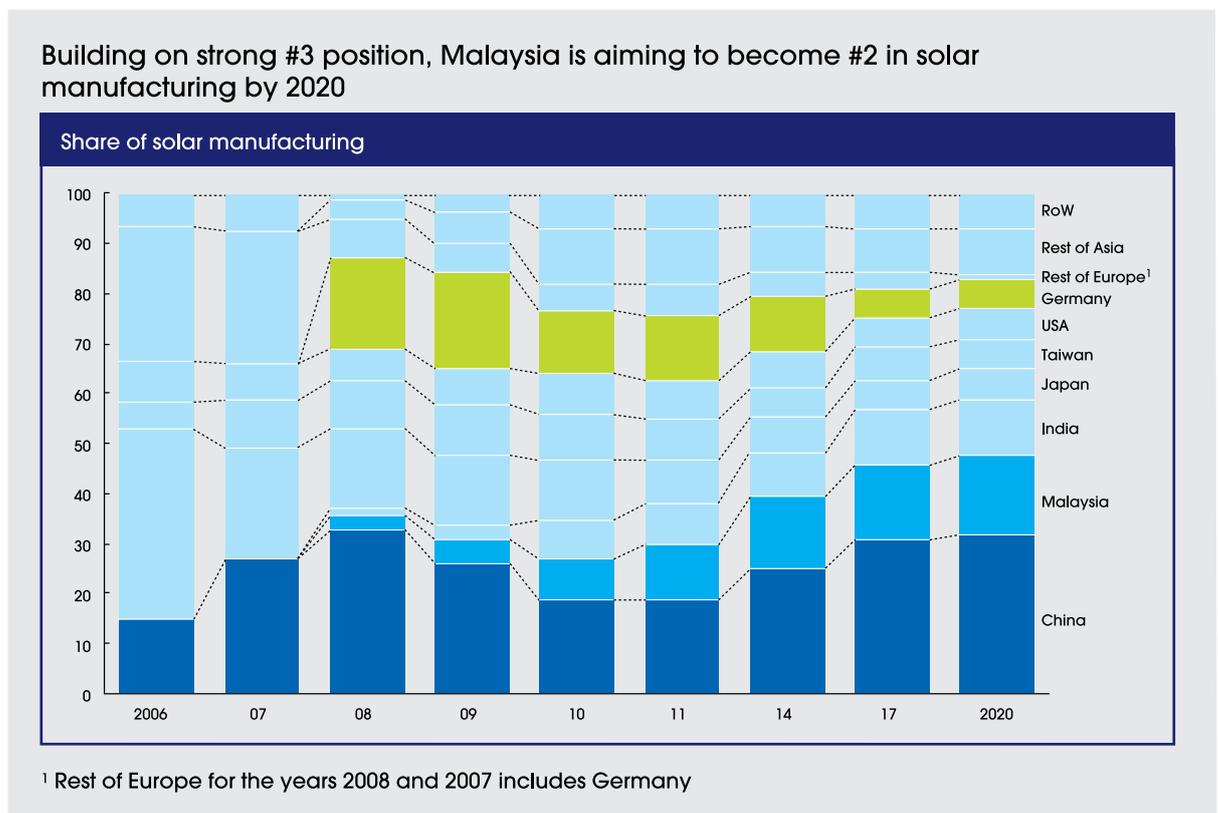
⁶ Source: International Energy Outlook, EPIA, EREC-Renewable Energy Scenario to 2040

While solar is currently expensive, average installed system prices have dropped to about RM16.40 per watt and we expect prices to fall further to RM6.70 per watt or lower in 2020. Grid parity, when solar prices become competitive with other energy sources, is expected to be reached in some regions like Italy and California as early as 2015.

Due to the declining cost of solar, the market is forecasted to grow very rapidly at about 30 percent per year through 2015 and then at a rate of 25 percent per year until 2020. This implies an increase of 100 times in solar share by 2020, when it would account for 5 percent of renewable energies and 1 percent of global energy supply. This will translate into global cumulative installed capacity of 560 gigawatts, with annual demand of 113 gigawatts and RM918 billion of revenues in 2020. Asia will drive a significant portion of this demand and supply by 2020. This demand trend is expected to continue over the next few decades, and solar is predicted to account for as much as 25 percent of global energy supply by 2050.

Malaysia has a strong starting position in solar. After projects committed for 2011 come on stream, Malaysia will be the third largest producer of solar cells after China and Germany. We already have companies across the entire value chain, from silicon production (Tokuyama) to solar cell manufacturing (Sunpower and Q-Cell) and module assembly (Flextronics, First Solar, Solartif). Our aspiration is to increase our market share to 17 percent of the world production and reach the number two position behind China by 2020 (Exhibit 11-4). This implies Malaysia needs to increase cell and wafer production capacity by 10 times and production capacity for silicon by 23 times by 2020. While ambitious this is achievable as the industry’s high rate of growth provides opportunities for Malaysia to capture new production capacity, especially as production is relocated from high cost countries such as Germany.

Exhibit 11-4



SOURCE: EU Joint Research Centre PV Report '09; MBIPV Industry Handbook '09 - MBIPV; PTM report '09

EPP 5: Increasing the Number of Silicon Producers

Rationale

Manufacturers of solar silicon ingots require a steady supply of high grade silica and large amounts of reliable energy provided at reasonable prices to process raw silica. Sarawak is an ideal location as it is a source of high grade silica and offers renewable energy (e.g. hydropower) at attractive rates with guaranteed reliability. Tokuyama is constructing a solar silicon wafer manufacturing plant at the Samalaju Park in Sarawak to take advantage of the low cost of power.

Actions

MIDA will lead this EPP, supported by RECODA. MIDA, with the help of other Government agencies, will attract one or two selected major companies each year to increase the amount of silicon produced in Malaysia from 6 kilo tons today to around 170 kilo tons in 2020. We have already identified the following companies for this: Wacker Chemie, Hemlock, GCL Poly, OCI, REC, Solarworld, LDK, Suntech and E-Ton. Additionally, Malaysia will develop two domestic silicon companies. Note that semiconductor silicon substrates are similar to but higher grade than solar substrates, and can be produced by the same companies. The target for solar silicon substrates is in addition to the target set for semiconductor silicon substrate manufacturers.

MIDA will start the process of attracting silicon producers at the beginning of 2011. To take the first company as an example, the process would begin in January 2011 and the plant would start operation in January 2014. The steps to be taken are as follows:

- Solar company submits proposal to MIDA – January to December 2011;
- MIDA assesses proposal and announces decision – January to June 2012;
- MIDA organises industrial linkages and local sourcing – July 2012 to December 2013; and
- Solar company starts construction and commissioning – July 2012 to December 2013.

The targets for the domestic champions are to have the first plant operating by October 2012 and the second plant by December 2014.

Enablers

To jumpstart the substrate industry in Sarawak, we would invest in creating a domestic champion for substrate manufacturing. This would take the form of a joint venture with a leading international company to provide access to the technology.

MIDA will promote Sarawak overseas as a site for silicon producers and solar glass and provide incentives (tax incentive, power rebates) to new silicon producers with pioneer status.

MOSTI will provide technical advice and support in solar substrate R&D, technology platform and innovation. It will also identify basic research areas with universities and applied research areas in collaboration with local and international research institutions.

The Government will invest in making Bintulu an attractive, liveable city. As the nearest town to Semalaju industrial park, Bintulu is important to Sarawak's solar initiative, but its current state is a deterrent for talent. Government will also upgrade Bintulu airport to an international airport, so visitors no longer need to transit through either Kuala Lumpur or Kuching. The section on regional enablers has more detail.

To address the power needs of the industry, we will allocate priority for hydroelectric power to the solar industry rather than other energy-intensive industries like aluminium and steel.

Funding

The cumulative funding required from 2010 to 2020 is RM12.5 billion in private investment and RM1.3 billion in public investment.

Impact

The EPP will provide incremental GNI of RM3.4 billion and create 20,000 jobs.

EPP 6: Growing Wafer and Cell Producers

Rationale

The solar wafer and cell manufacturing process involves preparing the silicon to serve as photosensitive cells. Solar cell manufacturers in Malaysia today include First Solar (Northern Corridor), Sunpower (Melaka) and Q-Cell (Klang Valley). The solar cell manufacturing process has similarities with the semiconductor fabrication process, as manufacturers require sites suitable for hosting state-of-the-art equipment and clean rooms. The Northern Corridor, as the established cluster for Malaysia's semiconductor industry, provides the right environment for solar wafer and cell manufacturers. However it needs some upgrades to transportation infrastructure for a sea port and rail transport. Necessary silicon can be supplied by silicon producers established in Sarawak.

Malaysia has to increase its production capacity by 10 times from the current 2.3 gigawatts to 23 gigawatts in 2020 to reach our objective of becoming the second largest producer of solar cells globally. This will require MIDA to each year bring in one or more selected companies with cumulative capacity of 2 gigawatts for wafers and/or cells.

Actions

MIDA will lead this EPP, supported by the Penang Skills Development Centre (PSDC), SHRDC and SIRIM (the Malaysian Standards and Quality Institute).

MIDA has already confirmed additional capacity of 2 gigawatts in 2011 and more companies have announced plans to set up production facilities of an additional 1 gigawatt until 2013 in Malaysia.

The private sector will also support the growth of solar wafer and cell manufacturing. Penang Skills Development Centre and Selangor Human Resource Develop Centre in partnership with industry will introduce courses or modules in solar wafer and cell manufacturing.

MIDA will start the process of attracting wafer and cell producers at the beginning of 2011. The process is similar to that described in the silicon producers EPP.

Enablers

MIDA will promote Northern Corridor and Klang Valley as sites for wafer and cell producers and will provide incentives to pioneering wafer and cell producers.

The Ministry of Science, Technology & Innovation (MOSTI) will establish a shared solar test centre, which would provide product certifications required for each step of the solar production chain and spur innovation in the industry. This would lower the cost of establishing an operation in Malaysia to individual manufacturers. MOSTI will also establish a solar R&D lab and IP centre to research thin film and crystalline solar technology. The focus will include third generation applied research for solar PV technology as well as fourth generation basic research.

KeTTHA will provide strategic directions for local solar PV implementation. MOSTI (through SIRIM) will provide technical advice and support in solar PV R&D, technology platform and innovation.

SIRIM will also establish national standards for solar products, which would ensure safety and competitiveness of Malaysian products in the international markets.

Funding

The cumulative funding required from 2010 to 2020 is RM9.1 billion in private investment and RM1.0 billion in public investment.

Impact

The EPP will provide incremental GNI of RM7.3 billion and create 21,000 jobs.

EPP 7: Increasing Solar Module Producers

Rationale

Solar module production involves packaging the solar cells into finished modules. Module assembly operations in Malaysia today include Flextronics (Johor) and FirstSolar (Kulim, Northern Corridor). The process is relatively labour intensive so lower labour costs make a site attractive. High-quality glass is packaged with thin film solar modules, which makes access to locally produced glass important (e.g. SunBear is planning to establish a plant in Sabah, if gas supply can be assured). The finished solar modules are also relatively bulky making logistics access important.

For these reasons, Johor is an attractive location for module producers due to its relatively low labour costs and easy access to two airports (Senai and Singapore) and to the deep sea port of Tanjung Pelepas. This potentially makes Malaysia a prime location for module manufacturers targeting China, Southeast Asia, India and Australia. Johor also offers easy access to an existing testing and certification centre in Singapore. Flextronics already has a large-scale solar module assembly operation in Johor.

Actions

MIDA will lead this EPP, supported by the Iskandar Regional Development Authority (IRDA).

Our objective is for Malaysia to become a major manufacturing location for modules serving the domestic and Asian markets. Malaysia will leverage the nearby production of cells, our relatively cheap but highly qualified workforce, our experience in automation and our logistical access to the region.

MIDA will start the process of attracting module producers at the beginning of 2011. The process is similar to that described in the silicon producers EPP.

Enabler

MIDA will promote Johor as a hub for module production and provide incentives to pioneering module manufacturers. It will also attract glass producers to Johor, which are needed for thin film solar modules, as well as supporting industries such as manufacturers for glass, junction boxes, cables, ethylene-vinyl acetate and aluminium frames like Mitsui or Huber & Suhner.

We will address the challenges of making Johor attractive as a site for manufacturing in general. See details in section on regional enablers.

MIDA is already working to assure natural gas supply to glass producers interested in setting up in Malaysia. Sarawak can also develop as a site for glass manufacturing given the availability of silica as well as natural gas.

We will assess the potential for partnership with Singapore to attract solar investments spanning both Singapore and Johor. This could be in the form of a joint working committee of Singapore Economic Development Board (EDB)-MIDA-IRDA. Singapore is attempting to build up solar cell production capabilities, which would complement module production capabilities in Johor.

MOSTI will collaborate with universities to provide technical advice and support in solar module R&D, technology platform and innovation for local small and medium enterprises (SMEs).

Funding

The cumulative funding required from 2010 to 2020 is RM6.4 billion in private investment and RM0.6 billion in public investment.

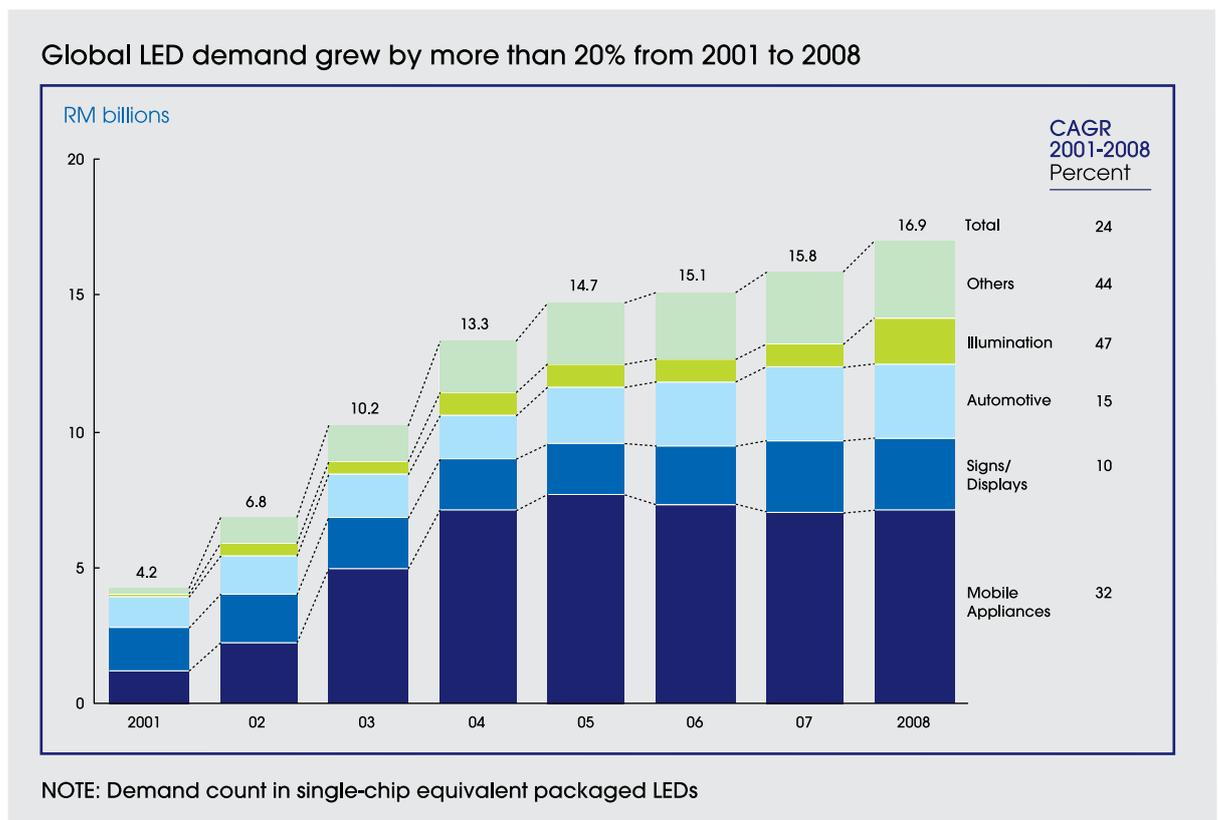
Impact

The EPP will provide incremental GNI of RM3.2 billion and create 14,000 jobs.

LIGHT EMITTING DIODES

In the last decade, the light emitting diode (LED) industry has seen annual growth of 24 percent (*Exhibit 11-5*) largely due to the growth of mobile applications. Colour screens for mobile appliances like phones and laptop computers, which both use LED backlights, have become increasingly prevalent. Going forward, LED growth is being driven by LED televisions, which use LEDs as backlighting (often called LED TVs), more mobile devices and replacement of conventional lighting as legislation from governments and environmental awareness among consumers grows.

Exhibit 11-5



SOURCE: Strategies Unlimited; Canaccord Adams; Capital IQ

Malaysia currently exports RM1.8 billion (2008) of LED products, which represent approximately 10 percent of the global LED market, with most of these exports in the illumination sector. LED lighting is also known as solid state lighting (SSL) due to the solid nature of the semiconductor, as compared to gas, plasma or electric filaments found in conventional lighting. SSL is one of the fastest growing sub-segments, projected to grow at 28 percent per annum over the next 10 years to a size of RM170 billion.

Malaysia has the opportunity to become the global hub for SSL. We currently enjoy strong competitive positioning in SSL as compared to the other LED sub-segments that are dominated by countries such as Taiwan. Four of the largest global SSL companies either operate in or contract a significant portion of work to companies in Malaysia. They perform a variety of operations ranging from R&D, wafer fabrication to packaging and applications. There are also a number of local companies involved in other areas of SSL lighting such as contract manufacturing, systems integration and application design as well as speciality companies focused on various heating and optical elements.

However, while Malaysia has many downstream SSL companies (e.g. in packaging and testing), we need to have more upstream companies (e.g. in chip and application R&D).

EPP 8: Developing LED Front-end Operations

Rationale

In order for Malaysia to capitalise on its position in the global SSL market, it needs to further develop the cluster by filling in missing gaps and investing in its strengths. By bringing in the missing higher-value parts of the value chain (front-end) and providing the right environment for designers of SSL products, we can make Malaysia the world's preferred location for SSL companies.

Actions

The Ministry of International Trade and Industry (MITI) and MIDA will lead this EPP, supported by MOSTI, the Penang Development Corporation and NCIA.

We will develop the SSL cluster in Malaysia by creating a thriving ecosystem for SSL companies and attracting global SSL companies to expand or start front-end operations in Malaysia. First, this involves attracting at least one major materials or substrate supplier and also one epitaxy manufacturer to complete the SSL value chain in Malaysia. This will create cluster synergies and bring in higher value-added jobs such as epitaxy engineers. Second, we need to continue to grow LED wafer fabrication production in Malaysia. There is already one wafer fabrication plant for LEDs, but we need more to fully develop this part of the cluster. Third, Malaysia's strong position as a packaging hub for SSL products needs to be aggressively enhanced and grown.

Enablers

MIDA will aggressively target front-end materials and substrate suppliers and epitaxy manufacturers (e.g. Dow Corning, Hysol) to bring one of each into Malaysia by 2014. At the same time, MIDA will attract at least one new global company to set up wafer fabrication operations here by 2015.

MIDA will increase financial support and incentives (e.g. R&D and training grants, revolving loans) for the expansion of LED companies already here.

Local contract manufacturers will be assisted by MITI and Malaysia External Trade Development Corporation (MATRADE) in reaching out to foreign lighting companies with the intent of helping local manufacturers gain a larger share of the LED outsourcing market. The objective is to help Malaysia grow its LED packaging market share by at least 15 percent annually for the next 10 years.

Import duty will be lifted by MITI on core raw materials until Malaysia-based producers of these materials are in place, which is expected by 2013. The Ministry of Finance will exempt federal taxes on domestic sales of advanced LED products that meet prescribed environmental standards.

Industry has given feedback that tariffs imposed on LED products exported from Malaysia to China are impeding the growth of Malaysia's LED industry. In a review of the ASEAN-China Free Trade Agreement, Malaysia will negotiate to remove tariffs on all LED products in any form (e.g. wafers, household lights) exported to China. The target is for revised tariff rates to take effect by December 2011.

MIDA has already started the process of attracting companies and will need to move quickly to ensure the success of this EPP. The objective is to have one substrate manufacturer and one epitaxy manufacturer open plants in Malaysia by 2014 and have at least one new wafer fabrication plant by 2015, while growing packaging by 15 percent annually.

MOSTI will provide technical advice and support in R&D, technology platform and innovation. It will also identify basic research areas with universities and applied research areas with local and international research institutions, including potential new product development (prototypes).

Funding

The cumulative funding required from 2010 to 2020 is RM3.5 billion in private investment and RM0.5 billion in public investment.

Impact

The EPP will provide incremental GNI of RM2.7 billion and create 7,300 jobs.

EPP 9: Expanding LED Packaging and Equipment

Rationale

This EPP seeks to grow the LED packaging and application design landscape, both organically and through inviting lighting MNCs to set up operations here, with a target of 15 percent growth annually for the next 10 years.

Actions

MIDA will encourage foreign MNCs with LED-related service operations to further grow their Malaysian base of services for Malaysia and the region (three of the largest global players are already here). Local companies that can fill the niche services gap required by the industry will also be developed.

Enablers

MIDA will facilitate provision of low-cost land, infrastructure and financial incentives for lighting MNCs already in Malaysia to expand capacity and also to attract new ones to set up operations.

MITI and MATRADE overseas missions will also help to promote local contract manufacturers. These missions will potentially offer tax incentives for foreign companies to utilise these services of local contract manufacturers.

MOSTI will provide technical advice and support in LED packaging R&D, technology platform and innovation.

Funding

The cumulative funding required from 2010 to 2020 is RM1.6 billion in private investment and RM0.2 billion in public investment.

Impact

The EPP will create incremental GNI of RM1.4 billion and 3,700 jobs.

EPP 10: Creating Local Solid State Lighting Champions

Rationale

The development of an SSL cluster provides a unique opportunity to develop local SSL companies into globally renowned brands. Local companies (e.g. ItraMAS, DSEM) are starting to succeed globally through innovation and should be further encouraged and assisted where possible.

Actions

MITI and MIDA will lead this EPP and be supported by MOSTI, SME Corporation, NCIA, Ministry of Higher Education (MoHE), SDCs and Ministry of Energy, Green Technology and Water (KeTTHA).

We will develop at least five Malaysian companies into regional and global brands for SSL products and/or components by 2020. The objective is to have at least one local SSL company become a globally recognised name in the SSL market every year from 2012 to 2016. We define global recognition as winning multiple awards from international SSL bodies or having annual sales volume exceeding RM178 million outside of Malaysia.

Enablers

NCIA and PSDC will facilitate the setting up of a LED certification centre by 2012 to verify the compliance of Malaysian products to global standards and increase global awareness and assurance in Malaysian LED products as well as help local companies develop their test and certification procedures.

SME Corporation will grant working capital loans to SSL companies to help them expand and research grants for them to do R&D in thermals, optics and other SSL design areas.

MOSTI will provide technical advice and support in R&D, technology platform and innovation.

MoHE and the SDCs will develop local talent via skills development and university programmes focused on key SSL areas such as thermals and optics.

The Government will automatically approve working visas for foreign talent involved in knowledge work for SSL companies (e.g. engineers and designers) to supplement the lack of local expertise for design and development of LED-related products.

The Government will need to replace the current environmental regulation enacted for energy conservation in lighting that bans incandescent lighting by 2015 with a specific directive that only SSL lighting can be utilised (rather than fluorescent lighting) by 2020. The effort for this should be led by KeTTHA with assistance from MITI.

Funding

The cumulative funding required from 2010 to 2020 is RM0.5 billion in private investment and RM0.1 billion in public investment.

Impact

The EPP will provide incremental GNI of RM1.1 billion and create 2,800 jobs.

INDUSTRIAL ELECTRONICS AND ELECTRICAL HOME APPLIANCES

Industrial electronics comprises several sub-sectors involving the manufacturing of precision equipment used in industrial and commercial settings. Of these, the test and measurement, wireless communication, transmission and distribution and automation markets are the most attractive. The overall global market size for these sub-sectors is estimated to be about RM1,070 billion, with projected annual growth of 3 to 5 percent over the next 10 years.

EPP 11: Building a Test and Measurement Hub

Rationale

Malaysia has established a very strong foundation in test and measurement. Agilent, a RM16 billion US company with approximately 25 to 30 percent global market share in electronics measurement, currently manufactures significant percentage of that equipment in Penang. The company continues to view Malaysia as a strategic manufacturing location for its business and see opportunities for expansion. Agilent uses many local suppliers and outsources a significant portion of production and some design activities to companies in Malaysia, thereby contributing to an ecosystem for test and measurement in Malaysia. Agilent's presence in Malaysia, together with the ecosystem of service providers, has made Malaysia attractive to other test and measurement companies. For example, National Instruments is in the process of building a plant in Penang after announcing plans in 2008. In addition, test and measurement knowledge is a key enabler for many other sectors, so it can be leveraged to speed up the expansion of other electronics industry sectors in Malaysia.

Actions

MIDA will lead this EPP, supported by Agilent.

Our strategy is to build a complete test and measurement hub in the Northern Corridor:

Agilent will bring the manufacturing of advanced and sophisticated measurement products to Malaysia to complement its current manufacture of electronic measurement equipment in Penang. Agilent will be able to leverage existing manufacturing capabilities and the current supply chain ecosystem.

Use the presence of Agilent and National Instruments as a selling point to attract other test and measurement companies (such as Rohde & Schwarz, Fluke, Keithley and Tektronix) and related industries, such as bioanalytics.

Grow local vendor ecosystem to serve the test and measurement multinational companies, including suppliers, contract manufacturers and design houses.

Develop talent and build technology shared services, which would make it easier for innovative local firms to succeed.

By 2011, Malaysia should attract 30 percent more investments in test and measurement from multinational companies and have five more local test and measurement design partners. By 2013, Malaysia should have two more local test and measurement design partners.

Enablers

Many countries in Asia are competing to attract the manufacturing of advanced and sophisticated measurement products. It is critical that the Government provides the necessary support to Agilent to win this business for Malaysia by granting the required incentives and support expeditiously.

We will negotiate a free trade agreement with the USA. This will put Malaysia on par with some of our neighbouring countries and increase Malaysia's competitiveness in winning business deals that require a Government Services Agreement with the USA. Without GSA status, Malaysia will become less competitive in the industrial electronics sector.

We will promote the Northern Corridor and provide necessary incentives and support to leading test and measurement companies as well as other multinational industries that can leverage on our test and measurement competency and capability.

We will also provide incentives to local design houses that serve the test and measurement Multinational companies. We should also establish a test and measurement shared services centre, which will make technology more accessible to local design houses and lower their cost of establishing operations.

Funding

The cumulative funding required from 2010 to 2020 is RM4.9 billion in private investment and RM1.0 billion in public investment.

Impact

The EPP will provide incremental GNI of RM1.4 billion and create 7,000 jobs.

EPP 12: Expanding Wireless Communication and Radio Frequency Identification (RFID)

Rationale

Wireless communications: Motorola designs and manufactures a substantial proportion of its two-way subscriber radio products in Penang. These products serve the critical communications needs of global customers. Similar to the strategy articulated for test and measurement, together with support from the Malaysian Government, Motorola's presence can become a strong base for growing local outsource design partners and Malaysia-based original design manufacturers and eventually building a complete wireless communication ecosystem. The competencies developed from more than 30 years of design and development work by Malaysian engineers in designing sophisticated products provide a core to grow local design houses. However, the cost of entry into design work for wireless communications is prohibitively high, and action needs to be taken, both by the private sector and Government, to jump-start this industry.

Radio frequency identification (RFID) uses radio waves to identify people or objects, with applications in contactless payment, asset management, trusted identification (ID) and document tracking. The current global market (2009) for RFID is RM19.9 billion and is expected to grow to RM54 billion in 2020. Malaysia was one of the world's earliest adopters of RFID technology, from toll payments (e.g. TouchNGo) to library usage (e.g. Penang State Library UHF Library). Malaysia also has local RFID success stories, such as IRIS (which pioneered the world's first electronic passport and immigration autogate) and Smartag Solutions (library and logistics).

Our strategy is to grow RFID in Malaysia by supporting the growth of local companies. The Malaysian Communications and Multimedia Commission (MCMC) is the lead agency for developing the RFID industry. The Government has already taken steps to support the growth of the RFID industry including establishing an RFID Centre of Excellence, supporting international RFID standards and creating a National RFID Roadmap. Our growth plan for RFID builds on these foundations.

Actions

For wireless communications, NCIA will lead actions needed to grow this sector, supported by MIDA and Motorola.

The EPP is to grow the ecosystem of local outsourcing service providers in two-way radios. The ecosystem will initially serve Motorola Penang, but will eventually make the Northern Corridor more attractive as a site for other wireless communication multinational companies. The ecosystem growth plan includes local design houses as well as Malaysia-based original design manufacturers (ODMs).

Motorola will work on developing the ecosystem of service providers for wireless communications. First, it is working towards a co-location model with design partners and shared services and will be the anchor tenant of a shared facility or Innoplex. It will identify possible partners from existing suppliers that are willing to upgrade their capabilities to include design capabilities. Lastly, Motorola will work together with PSDC and MIMOS to develop training programmes to build talent among the service providers.

Radio and enterprise product ODM ecosystem will be completed by 2013.

For RFID, MCMC will lead efforts to expand this sector, supported by IRIS. The EPP consists of three sub-projects in RFID applications.

Develop more trusted ID products for the export and domestic markets. IRIS is known globally for its innovation in trusted ID products including electronic passports (world's first in 1998) and multi-application smart cards. Trusted ID products provide advanced identity protection (e.g. national identification cards) and are expected to experience significant growth over the next 10 years. With the introduction by the International Civil Aviation Organization of global interoperability of electronic passports, more than 80 countries worldwide have already issued e-passports. In the next two to five years, we expect that more than 150 countries will issue e-passports. The key components in e-passports are the RFID chip and antenna. Currently IRIS has around 15 to 20 percent market share in this segment globally, and IRIS plans to further penetrate local and global markets to tap the market growth. The goal by 2015 is to export to five additional countries.

Promote RFID implementation for logistics and transportation applications in Malaysia and Asia Pacific. MCMC will target countries such as Thailand, Vietnam, Laos, China, Taiwan and various Middle East countries. Companies like Smartag, a Malaysian RFID solution company, will become pilots in the project. Smartag will actively engage in the global standard-setting process and create RFID applications based on those standards, with collaboration from selected local universities.

Use RFID technology in halal track and trace. MCMC, JAKIM (Department of Islamic Development Malaysia) and SIRIM plan to undertake an E-halal project to enhance Malaysia as the halal certification hub for the global market by using RFID to track halal end-to-end for JAKIM certification.

Our target is for Trusted ID to be exported to five more countries by 2014. Logistics and transportation RFID solutions will be deployed in South East Asia and China by 2015. JAKIM's halal certification should be accepted globally by 2015.

Enablers

For wireless communications, NCIA will establish a two-way radio shared service lab for local design firms. This would reduce their start-up costs and make Malaysia more attractive as a site for wireless communication design and outsourced services.

We will also establish an Innoplex design centre, a facility for shared design services and local design houses. Public or private funding can be in the form of a build-and-lease arrangement.

For RFID, we need to enable its use in logistics and transportation. MCMC is working with Customs to develop RFID as a tool to facilitate trade between free trade zones, free industrial zones, bonded zones and transit container yards. A proof of concept has been deployed at the Johor port, and there are plans to roll-out to other ports in Malaysia. The success of this initiative will require close coordination among Government departments, and the relevant agencies (MCMC, Customs, Immigration) to work together to implement this.

MCMC and MIDA will organise promotional activities and awareness campaigns for end-users (both consumers, Government bodies and business) on the advantages of RFID. They will also promote the Multimedia Super Corridor MSC status and selected areas as key testing and commercialisation trial sites to RFID companies.

MCMC will work with GS1 Global, which designs and implements global standards to make Malaysia the Asia centre of excellence for the electronic product code global RFID and electronic product code information service initiatives.

MATRADE, MDeC and MCMC will support and encourage local RFID companies in Government procurement and through Malaysian trade missions and embassies.

The E-halal project will require global acceptance of Malaysia's halal certification. JAKIM will promote and negotiate the acceptance of Malaysia's halal certification worldwide.

Funding

The cumulative funding required from 2010 to 2020 is RM0.7 billion in private investment.

Impact

The EPP will provide incremental GNI of RM1.8 billion (RM374 million in wireless communication and RM1.4 billion in RFID). It will also create 4,400 jobs (400 in wireless communication and 4,000 in RFID).

EPP 13: Growing Automation Equipment Manufacturing

Rationale

Automation equipment refers to equipment used to automate processes, for example, manufacturing plant automation equipment. This includes complex pieces of equipment such as robotics. The global leader in automation equipment, ABB is based in Klang Valley and uses Malaysia as its regional headquarters (ABB has Operational Headquarters Status granted by MIDA). However, ABB only assembles automation equipment in Malaysia; it does not manufacture the core components here. Given the presence of ABB and its senior management in Malaysia, the natural next step is for Malaysia to build new capabilities as an automation equipment manufacturing site.

Actions

MIDA will lead this EPP. We will promote Malaysia as a manufacturing site (not just an assembly site) to leading automation equipment manufacturers, including ABB, Siemens and Schneider.

Our target is for two more automation equipment multinational companies to manufacture in Malaysia by 2015.

Enablers

MIDA will promote Malaysia as a manufacturing site for automation equipment to leading automation equipment manufacturers such as ABB, Siemens and Schneider. We will also provide Pioneer Status incentives to automation equipment manufacturers to manufacture automation equipment in Malaysia.

Funding

The cumulative funding required from 2010 to 2020 is RM0.4 billion in private investment.

Impact

The EPP will provide incremental GNI of RM125 million and create 1,200 jobs.

EPP 14: Building Transmission and Distribution Companies

Rationale

Transmission and distribution equipment refers to equipment used in the generation, transmission and distribution of electricity. This includes switching apparatus, distribution boards, control panels, transformers and cables and conductors. The technology can be highly value-added, and substantial manufacturing of complex high voltage transmission and distribution equipment is still done in high-cost countries in Europe and Japan.

Local companies include Tenaga Switchgear (a subsidiary of Tenaga Nasional Berhad), Tamco and EPE for switching apparatus; Malaysian Transformer Manufacturing, SGB and EWT for transformers; Tenaga Cable Industries, Leader and Universal Cables for cables and conductors; and SMEs serve as sub-vendors. Multinationals including ABB, Areva and Siemens are also present in Malaysia.

However, companies generally do not manufacture (as distinct from assemble) in Malaysia. Tenaga Switchgear uses Malaysia as a base to design, assemble, sell and provide engineering applications for transmission and distribution industry in the region. ABB, Areva and Siemens are present in Malaysia but do not manufacture transmission and distribution equipment here.

Actions

MITI will lead this EPP and it will be supported by SIRIM.

We will build a cluster of transmission and distribution manufacturers in Malaysia. We aim to attract multinationals such as ABB, Siemens and Areva, as well as grow local companies such as Tenaga Switchgear, Tenaga Cable Industries and Malaysian Transformer Manufacturing. A key enabler will be the establishment of the high-power testing lab described below.

Our target is that a high-voltage test lab will be fully operational by October 2012, with the lab earning RM3 million revenue in its first year of operations and producing 10 local test specialists within a two-year period.

Enablers

A key enabler will be for SIRIM to set up a high-power testing lab to test high-value, high-voltage equipment. Transmission and distribution products need to be certified by an accredited short circuit testing liaison lab to be accepted by the international market. Most of these labs are in Europe (e.g. KEMA in Holland and CESI in Italy) forcing overseas manufacturers to conduct prototyping and testing in Europe, which is expensive (average about RM3.6 million per product). By establishing a high-voltage test lab in Malaysia, we will become a more attractive site for transmission and distribution manufacturing. The growth of local companies will be enhanced and we will be in a better position to attract manufacturing by multinationals, as the cost of new product development and turnaround time would be significantly reduced. The lab should be operated as a joint-venture between SIRIM and an internationally accredited lab such as KEMA or CESI so that the lab can be recognised as an accredited member.

MIDA will promote Malaysia as a manufacturing location to leading transmission and distribution equipment manufacturers such as ABB, Siemens, Areva and Alstom, e.g. by providing Pioneer Status and Operational Headquarters incentives to transmission and distribution equipment manufacturers.

Funding

The cumulative funding required from 2010 to 2020 is RM0.5 billion in private investment.

Impact

The EPP will provide incremental GNI of RM352 million and create 400 jobs.

EPP 15: Building an Electrical Home Appliance Manufacturing Hub and International Distribution Network

Rationale

Electrical home appliances in Malaysia are a market of RM3.6 billion with 7.1 percent growth from 2004 to 2009. Currently, there are a number of domestic home appliance companies with manufacturing expertise and local footprints, such as Pensonic, Khind, Joven and Alpha. Pensonic, based in Penang, is the biggest of these with a valuation of RM300 million and about 10 percent market share. Pensonic is proposing to expand by partnering with a few Malaysian sovereign fund partners to merge or acquire smaller scale electrical home appliance companies and build a strong international distribution network.

Actions

Pensonic will lead this EPP, supported by other investors. The first part of this project is to build a strong international market by targeting fast-growing ASEAN and Middle East markets on a multi-brand marketing platform. The expansion of sales into these high potential markets is expected to bring significant spillover growth to the Malaysian small and medium enterprise supply chain through outsourcing opportunities, which will deepen our supply chain expertise in the sector. Meanwhile, as many top Asian and European electrical home appliance brands are actively looking for outsourcing opportunities to OEMs or ODMs outside China, it is expected that a considerable portion of their production will be spun off to Malaysian manufacturers.

In order to support the sales growth from local and new international markets, the second part of the project aims to build a manufacturing hub to host the entire supply chain. The cluster will ensure sufficient and expandable plant capacity to support potential growth and will be located in a site close to transportation infrastructure, e.g. ports and railways.

The targets for the new company are to reach annual sales of RM2.2 billion and 50 percent of local sourcing by 2020.

Funding

The cumulative funding required from 2010 to 2020 is RM0.5 billion in private investment.

Impact

The EPP will provide incremental GNI of RM1.0 billion and create 18,000 jobs.

BUSINESS OPPORTUNITIES

Four of the sectors – semiconductor, solar, LED and Industrial Electronics– will also result in spillover business opportunities.

Business Opportunity 1: Semiconductors

A study of Silterra estimated that each dollar of operating expenditure spent by the semiconductor manufacturers generates about fifty cents of revenue for the supporting ecosystem, e.g. service providers to the semiconductor manufacturers, ranging from suppliers of specialty gases to equipment part cleaners. To provide a complete picture of the full benefits of building the semiconductor industry in Malaysia, we include these spinoff business opportunities in our GNI impact estimates. Spinoff business opportunities will provide incremental GNI of RM3.2 billion and create 25,000 jobs. The cumulative funding required from 2010 to 2020 is RM2.5 billion private.

Business Opportunity 2: Solar

Business opportunities in solar are based on estimates that between 15 and 20 percent of operating expenses from the solar EPP are spent on supporting industries, such as process equipment, sand mining, glass, aluminium, silane gas and wire saws. We would also work with multinational companies such as Applied Materials (equipment manufacturer) to transfer technologies to SMEs or to develop local supplier programmes. An additional RM8 billion GNI and 11,500 jobs will be created on goods and services from supporting industries. The cumulative funding required from 2010 to 2020 is RM5.8 billion in private investment and RM0.7 billion in public investment.

Business Opportunity 3: Light Emitting Diodes

Business opportunities in industrial electronics will concentrate on strengthening the supply chain and the Original Design Manufacturers (ODM) in Malaysia, especially for the RFID sector. With new RFID applications planned in the future such as contactless payment and asset tracking, more local companies and shared facilities, such as frequency simulation labs, would be set up to support the growth of the sector. We estimate the GNI impact to be RM165 million and create over 200 jobs. The cumulative funding required from 2010 to 2020 is RM6.9 million in private investment; no public funding is required.

Business Opportunity 4: Industrial Electronics

Business opportunities in industrial electronics will concentrate on strengthening the supply chain and the Original Design Manufacturers (ODM) in Malaysia, especially for the RFID sector. With new RFID applications planned in the future such as contactless payment and asset tracking, more local companies and shared facilities, such as frequency simulation labs, would be set up to support the growth of the sector. We estimate the GNI impact to be RM165 million and create over 200 jobs. The cumulative funding required from 2010 to 2020 is RM6.9 million in private investment; no public funding is required.

COMMON ENABLERS

The enablers are grouped into those specific to four key regional clusters (the Northern Corridor, Klang Valley, Johor, and Sabah and Sarawak) and more general, cross-cutting enablers. Cross-cutting enablers are grouped by Government role, talent, infrastructure and technical ecosystem. The most critical enablers are discussed below.

Enable Northern Corridor

Develop Batu Kawan into a new site for high value-added E&E activity. Batu Kawan is being redeveloped. Existing plans include a second bridge for Penang island terminating at Batu Kawan. With limited space on Penang island, Batu Kawan has the potential to be a new site for high value-added E&E activities in the region. We would take our existing plans for Batu Kawan to the next level and turn it into a highly liveable city that is attractive to high-end E&E talent, with facilities such as an InnoPlex and Centre for Engineering Excellence (described under Technical Ecosystem).

This will require public funding of RM147 million (this is on top of the funds already budgeted for the redevelopment of Batu Kawan) and private funding of RM845 million. NCIA will be the owner. The completion date is December 2015.

Grant Multimedia Super Corridor Status to all E&E firms in the whole of Northern Corridor.

Multimedia Super Corridor (MSC) status provides benefits including unrestricted employment of foreign knowledge workers, exemption from local ownership requirements, easier employment of foreign talent and the right to source capital globally (providing flexibility to repatriate any amount of capital, divestment proceeds, profits and dividends, as well as to borrow in any foreign currency). While firms can apply individually for MSC status, it would make an enormous difference to offer MSC status to all E&E firms in Northern Corridor. An exception is that Pioneer Status, which is normally part of MSC status, would not be granted automatically and would still need to be applied for on a case-by-case basis. This would send a dramatic signal that Northern Corridor is ready for business and committed to taking E&E to new heights.

This will require public funding of RM4.8 million and private funding of RM1.6 million. Ministry of Finance will be the owner. The completion date is December 2011.

Enable Klang Valley

Focus manufacturing incentives in Klang Valley on high-value manufacturing. Some manufacturing sites in Klang Valley sit on prime plots of land. Since land in Klang Valley is scarce, it is important that it is put to the best use, which is generally focused on higher value-added headquarters, design and sales and service operations. Any manufacturing site needs to be for high value-added complex manufacturing, and even then it should be located near the outskirts of Klang Valley, e.g. in Selangor Science Park. Incentives given to manufacturing in Klang Valley must therefore be granted very selectively and only to very high value-added manufacturing operations. This policy will be adopted by both MIDA (which manages non-land incentives) and by the relevant state Governments (which manage land leases and incentives).

Funding is not expected to be required. MIDA and state Governments (for land related incentives) will be the owners. The policy is targeted to be approved by December 2010.

Establish Industrial Design Centre of Excellence. Klang Valley has a cluster of headquarters of local E&E brands (e.g. Khind), but local brands require assistance to build design capabilities. The Industrial Design CoE will help local E&E firms build design capabilities in end-products to help them expand abroad.

This will require public funding of RM32 million and private funding of RM32 million. MDeC will be the owner. The completion date is December 2011.

Adapt best practices in commercialisation of university technology. Commercialisation of university technology will be critical in terms of providing a technological base to capitalise on Klang Valley's potential as a headquarters for local champions. Universities in Klang Valley adopt different approaches towards commercialisation, with varying degrees of success. Some adopt a lecturer-driven approach, while others use professional technology marketing experts to lead commercialisation and partnering efforts within the industry. The latter model has been more successful. MoHE should undertake a detailed study and disseminate best-practice guidelines to encourage universities to make commercialisation more successful.

This will require public funding of RM9.6 million and private funding of RM9.6 million. MoHE will be the owner. Completion date is May 2011.

Set up a strategic data analysis and planning unit under MOSTI. Local companies lack information on technological and market trends, which impedes their growth into local champions. MOSTI will set up a strategic data analysis and planning unit to provide market reports, analyse and disseminate information to SMEs. This will be modelled after strategic planning and marketing units in multinational companies.

This will require public funding of RM6.4 million. MOSTI will be the owner. The completion date is September 2010.

Enable Johor

Deepen partnership with Singapore. Johor's proximity to Singapore makes the state uniquely positioned to prosper through a win-win partnership with Singapore. Johor can capture manufacturing activities for which costs in Singapore are too high, while Singapore benefits as the activities remain in close proximity for supporting services (e.g. financial services). To enable this partnership, MIDA would propose to Singapore EDB to form a Singapore EDB-MIDA-IRDA Joint Committee. This Joint Committee would be the main platform to coordinate E&E activities between Johor and Singapore, for example, helping facilitate E&E investors who wish to invest in both Singapore and Johor.

A key initiative under the Joint Committee would be an agreement in which the Singapore EDB would help promote selected E&E investments in Johor. For example, potential investors approaching Singapore EDB may find Singapore's costs too high for certain activities. Therefore it would be advantageous for both regions if the EDB helped to direct such investments to Johor. Note that Singapore EDB already has a similar arrangement with the Riau Islands in Indonesia. A second initiative for the Joint Committee would be to develop a programme and curriculum for training Johor workers in Singapore's network of vocational institutes. Again, this would be a win-win proposition.

It would be a win for Singapore as training would enable Johor to better position itself to capture manufacturing, which may otherwise go elsewhere and deprive Singapore of the spinoff benefits. It would also be a win for Johor as Johor's workers stand to benefit from Singapore's network of training institutes.

The owner will be MIDA. The timeline for completion will be (1) Memorandum of understanding for Singapore EDB-MIDA-IRDA Joint Committee by June 2011; (2) Memorandum of understanding for Singapore EDB promotion of investments in Johor by June 2011; and (3) Develop curriculum and launch programme for training Johor workers in Singapore vocational institutes by December 2010. Funding is not expected to be required.

Promote Johor as a manufacturing site to Singapore-based companies. MIDA has conducted promotional missions in Singapore, but the emphasis in the past has centred on encouraging Singapore companies to set up operational headquarters in Malaysia. While headquarter activity is important, manufacturing remains critical as it would provide the bulk of employment opportunities. There is an under-tapped opportunity to encourage Singapore-based companies (including multinational companies with regional headquarters in Singapore) to set up manufacturing operations in Malaysia, particularly in Johor. We are aware that the converse happens frequently in which Singapore EDB makes frequent trips to Malaysia to encourage Malaysian-based companies to expand their operations to Singapore. MIDA would target its promotional efforts to gradually encourage increasingly high value-added manufacturing to relocate from Singapore to Johor.

The owner will be MIDA. The target will be at least two missions per year beginning December 2010. Funding is not expected to be required.

Enable Sabah and Sarawak

Expedite approvals by RECODA. Feedback from the industry is that the Sarawak RECODA approvals for new projects, including necessary immigration permits, should be shortened (now typically takes about six months). We must reduce approval timeline to at most two months by March 2011. Public funding is not expected to be required.

Attract talent to Sarawak. The substrate industry requires skilled talent (e.g. materials, chemical engineers), but Sarawak is not an appealing location for talent to live. We need to encourage talent to relocate to Sarawak and will offer preferential personal income tax rates to E&E talent in Sarawak, as well as provide automatic approval for the employment of skilled foreign talent in Sarawak.

The owners will be the Ministry of Finance and the Sarawak State Government. The target for policy approval is December 2011.

Attract niche sectors to Sabah. The substantial base of agriculture and tourism-based industries in Sabah will provide an ideal platform for niche E&E applications development, e.g. wireless sensor technologies, agricultural processing equipment and diagnostics tools. This will enable Sabah to participate in the high technology segment in E&E despite its relatively low participation in mainstream component manufacturing.

The Sabah Development Corridor (SDC) will champion the attractiveness of the Sabah (in terms of infrastructure, incentives, etc).

Stimulate Growth and Streamline Government Processes

We will improve incentives and regulations, as well as streamline processes to make it easier for the private sector to deal with the Government.

Incentives and regulations

Amend MIDA's R&D incentive to delink it from capital expenditure. MIDA's current R&D incentive is based on an income tax allowance on qualifying capital expenditure. Moving forward, MIDA will adopt a model where the R&D incentive is based on a tax deduction on total R&D expenditure (not just capital expenditure).

The owner will be MIDA. Funding is not expected to be required. The target for implementation of the new incentive is March 2011.

Systematically benchmark incentives and regulations against other countries. There is a need for an ongoing systematic process to ensure that Malaysia's incentives and regulations are competitive with those of our competitors. We will establish a process comprising an annual external survey of chief executive officers that would be complemented by twice yearly benchmarking reviews. The information collected would be used by MIDA to implement best-in-class incentives, regulations and investment promotion processes.

The owner will be MIDA. The first survey would be launched by February 2011, with a target for one external survey and two benchmarking exercises per year.

Processes and organisation

Expedite import tax exemption applications. The Tax Exemption Committee (JPC) would be fully empowered to approve tax exemption applications. The target is to reduce processing time to five working days.

Tax exemptions approved by JPC will also be linked with the Customs system so that there is no need for companies to physically show the approval letter each time they import goods.

The owner will be MIDA. Public funding required is RM6.4 million. The target is for new procedures and systems to be put in place by June 2011.

Fast-track Pioneer Status application process. We will fast-track the process for normal Pioneer Status applications (the normal Pioneer Status incentive offers a 70 percent tax exemption) and also increase administrative manpower for application handling and processing. The target is to shorten the processing time to five working days.

The owner will be MIDA. The target is for the new process to be put in place by June 2011.

Adopt paperless export application and e-logistics. Malaysia would adopt an e-logistics system for paperless clearance to enable quick 24x7 clearance. The Government will invest in the required e-Gov infrastructure in three key industrial zones (Northern, Central and Southern). Performance will be tracked by average transit times (between airport and factory) as well as subjective customer perception feedback through surveys.

The owners will be MITI and Customs. Public funding required is RM16 million. The target is for new systems to be put in place by May 2011.

Combine Electronics & Electrical divisions into a single unit under MIDA. MIDA will combine Electronics & Electrical into a single division, instead of the current two divisions.

The owner will be MIDA. Funding is not expected to be required. The target is for the new organisation structure to be in place by April 2011.

Have international industry representation on the MIDA board and establish an International Advisory Council. MIDA's board comprises primarily of representatives of the Malaysian Government and local firms. As a key part of MIDA's mandate is to attract foreign direct investment, which is especially important to the growth of the E&E sector, it is important to have international representatives on MIDA's board to provide an international perspective on the requirements of foreign investors and on MIDA's performance. We will revise MIDA's board composition to have a significant 50 percentage of private sector representation, of which a substantial share will be senior multinational representatives and establish an International Advisory Council for MIDA comprising Chairmen and CEOs of leading global MNCs.

The owner will be MIDA. The target for the new Board composition and the establishment of the International Advisory Council is April 2011.

Improve Talent Availability

As E&E is a talent intensive industry, the availability and quality of talent is a critical enabler. Industry feedback indicates that the lack of the right E&E talent in Malaysia has impeded the growth of the industry. We will take action to improve E&E talent availability through a plan which includes planning, formal education and training beyond formal education and coordinate closely with the Education NKEA.

Skill and headcount planning

Enhance the effectiveness of the Academia Industry Consultative Council (AICC). The AICC has recently been revitalised as a platform for coordinating between universities and the industry, and it has made E&E a key priority sector by adding robust representation from the E&E industry since October 2010.

Plan for engineering talent on a national basis. AICC and MIDA will work together to develop a supply and demand forecast for engineering talent, and the universities will respond by tailoring intake and curriculum plans. The plan will be reviewed annually.

The owner is MoHE. Funding is not expected to be required. The timeline for the first review of engineering talent requirements is January 2011.

Formal education

Lengthen and expand the industrial attachment programme. Industrial attachment programmes for undergraduates are typically three months long, which we consider too short to be effective. There are also currently limited numbers of attachment offered to undergraduates. We will remedy this challenge by: (1) Offering an incentive to companies that participate in industrial attachment programmes (e.g. matching grants for SMEs, cost estimated at RM500 per person per month targeting 1,000 persons per year); (2) AICC developing a list of participating companies and their requirements for interns to provide a consolidated view of available attachments; and (3) AICC working with universities and industry to extend the duration of attachments to six months or longer.

The owner is MoHE. Public funding required is RM32 million. The timeline for the rollout of the revamped attachment programme is March 2011.

Co-fund master and doctorate studies (Government and companies). Companies require high-calibre post-graduate talent. We estimate that about 1,000 engineers per year need post-graduate training. The cost per person is about RM10,000 per year and programmes are four years in length, so there would be 4,000 post-graduate students at any point in time. We will launch a programme in which companies and the Government co-fund the master and doctorate studies of engineers.

The owner is MoHE. Public funding required is RM384 million and private funding required is RM64 million. Note that companies would typically continue to pay employee salaries, which is not reflected in the funding indicated. The programme will be launched by January 2011.

Beyond formal education

Conduct graduate training programme to increase employability of unemployed graduates. There are 12 SDCs running the Industrial Skills Enhancement Programme (INSEP) that provides training to unemployed graduates to increase employability. The budget for the E&E INSEP programme for 2010 is estimated to be RM23 million, and the PSDC and Selangor Human Resource Development Centre (SHRDC) give significant focus to E&E, with more than 50 percent E&E INSEP courses. Industry feedback reveals that the programme has been useful and should be expanded. We will double the intake to increase the number of employable graduates and help re-skill graduates to meet industry needs. The key performance indicator will be for 90 percent of graduates from the INSEP programme to find jobs within three months.

The owners are SDCs. Public funding required is RM224 million. The launch of the expanded programme is targeted for January 2011.

Co-ordinate training needs with SDCs. MIDA will coordinate with the SDCs to develop training programmes and train personnel in advance of major investments. In doing so, MIDA will help ensure that Malaysia has the pipeline of skilled workers needed to compete as a manufacturing site. The owners are MIDA and SDCs.

Public funding required is RM6.4 million. The launch of the coordination programme is targeted for June 2011.

Expand training programmes for company employees. SDCs such as SHRDC and PSDC run well-received fast-track programmes for training new hires. To expand the scale and impact of the programme by 50 percent, the Government will co-fund the expansion of the training programme (curriculum development cost and facilities). This would have a public benefit as we will build a higher skilled workforce for Malaysia.

The owners are MIDA and the SDCs. Public funding required is RM32 million, and private funding required is RM6.4 million. The launch of the expanded programme is targeted for June 2011.

Automatically approve hiring of skilled technical expatriates in promoted E&E industries.

Although the process and requirements for hiring skilled foreign talent has been liberalised, there is still room for improvement in the process for hiring skilled foreign technical expertise. We will recommend providing automatic approval to hire skilled technical expatriates in E&E industries that are on MIDA's Promoted List. In addition, we will reduce the corresponding requirements, procedures and processing time involved in obtaining approval. Processing time for new hires should be less than one month and less than two weeks for renewals.

The owners are MOHR and KDN. Funding is not expected to be required. The new policy is expected to be implemented by January 2011.

Improve Essential Infrastructure

A key component of E&E manufacturing is the high quality of essential infrastructure. We will improve infrastructure in Malaysia to make us a more attractive location for E&E firms.

Enhance standards and availability for key utilities (power, water, gas, chemicals, Internet).

We will create a new national policy master plan to set and implement standards for key utilities to industrial and high technology parks. For example, the Energy Commission will develop a master plan for implementing the right power standards to support the growth of the E&E industry.

The owners are the key agencies responsible for the relevant utilities, including SPAN, Energy Commission, TNB, State Water Corps and KPKK. The public funding required is RM96 million, and the private funding required is RM80 million. The target for new standards to be established is May 2011.

Adopt flexible electricity tariffs as a competitive enabler. We will selectively offer flexible electricity tariff rates as part of a negotiated package to bring in key investments. This approach has already been adopted by some of our regional competitors (e.g. China, Vietnam) that offer negotiated rates. We currently offer negotiable tariffs rates in Sarawak and would extend this approach to the whole of Malaysia.

The owners will be TNB and MIDA. No direct funding will be required. The target for implementation of flexible tariff policy is June 2011.

Create a Technical Ecosystem

A technical ecosystem of shared service centres and labs will accelerate the rate of industry growth by lowering the cost of entry and by building a base of technical expertise. Earlier in this chapter, we detailed the shared service centre and labs linked to specific sectors and EPPs. In addition, we need an over-arching technical centre that takes a broader view of the industry.

Establish Centre for Engineering and Excellence. Khazanah has proposed establishing a Centre for Engineering and Excellence. The centre will be the platform for the private sector and academia to interact on post-graduate, post-doctoral programmes as well as to work on research-based projects, focused on demand from the private sector. It would also provide the link between fundamental research in the universities and technology specialists in the private sector. The centre will coordinate the activities of the other shared services centres and provide both industry and academia with international experts to facilitate the creation of an R&D ecosystem, through collaboration and partnership with leading institutions. As a not-for-profit foundation, the centre will ground its governance structure on the partnership between academia and industry, with industry providing the lead. It is envisaged that the centre will be the convergence point and nexus for technology development and proliferation in the E&E sector.

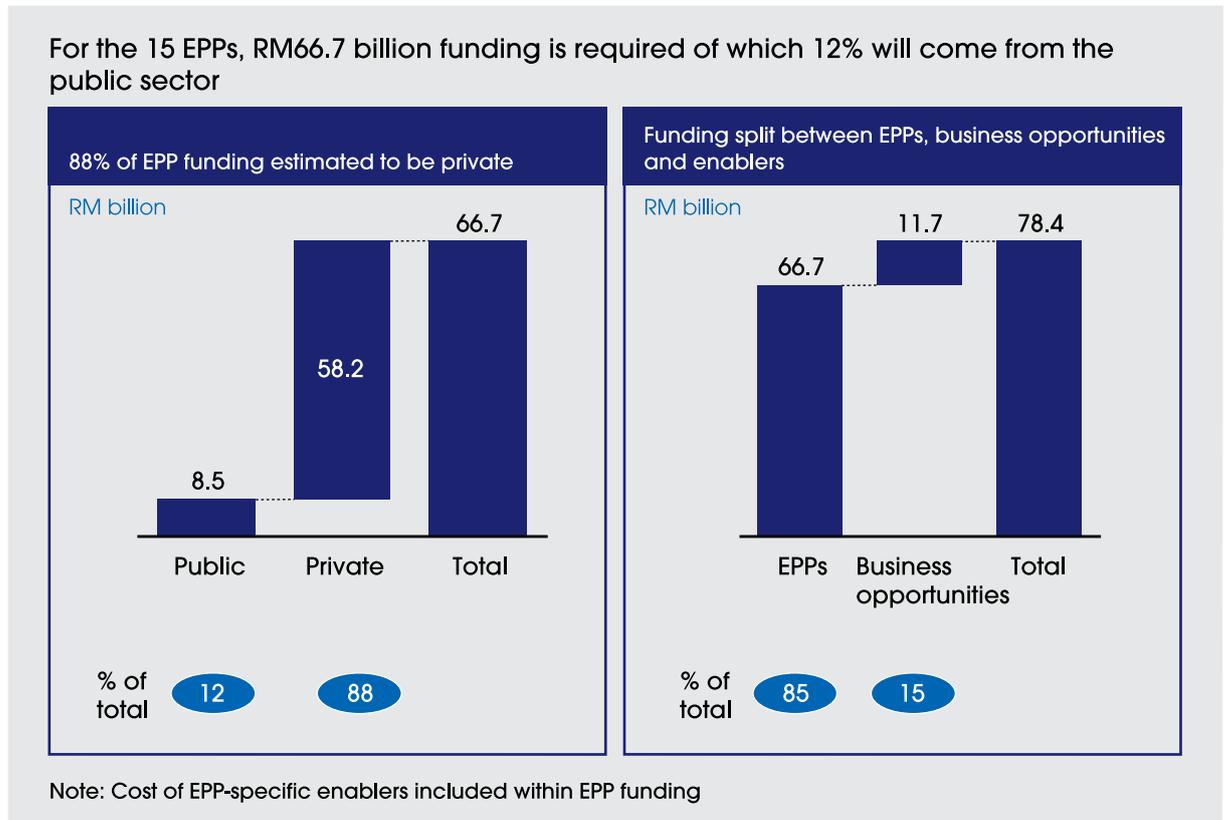
The owner will be Khazanah. The targeted completion date is March 2011.

FUNDING

The total cumulative funding requirement from 2010 to 2020 is RM78.4 billion, of which 85 percent (RM66.7 billion) will be used for EPPs. Of the total funding, 60 percent will be invested from 2010 to 2013, with the remaining 40 percent invested from 2014 to 2020.

For EPPs, funding will be 88 percent private and 12 percent public (*Exhibit 11-6*).

Exhibit 11-6



GOVERNANCE AND DELIVERY

Effective delivery of EPPs and enablers will require collaboration between the public and private sector.

Table 11-1 lists the lead owners and stakeholders of the EPPs.

Table 11-1

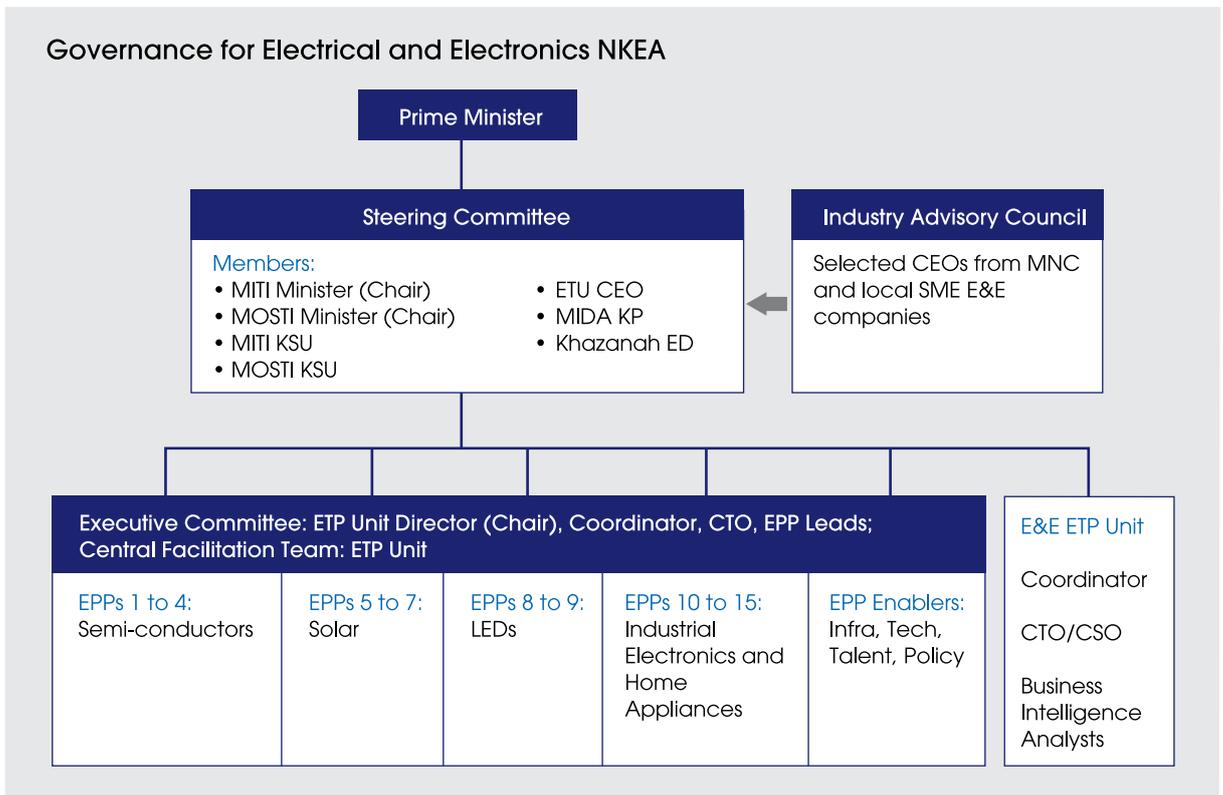
| EPP | Lead initiative owner | Other |
|--|---|--|
| Executing a Smart Follower Strategy for Mature Technology Fabrication | Malaysian Investment Development Authority | Fab consortium |
| Developing Assembly and Test Using Advanced Packaging Technology | Northern Corridor Implementation Authority | Malaysian Investment Development Authority |
| Developing Integrated Circuit Design Firms | Malaysian Investment Development Authority | Northern Corridor Implementation Authority, Economic Planning Unit, Silterra, fab consortium |
| Supporting the Growth of Substrate Manufacturers And Related Industries | Malaysian Investment Development Authority | Regional Economic Corridor Development Authority |
| Increasing the Number of Silicon Producers | Malaysian Investment Development Authority | Regional Economic Corridor Development Authority |
| Growing Wafer and Cell Producers | Malaysian Investment Development Authority | Penang Skills Development Centre, Selangor Human Resource Development Council, Standards and Industrial Research Institute of Malaysia |
| Increasing Solar Module Producers | Malaysian Investment Development Authority | Iskandar Regional Development Authority |
| Developing LED Front-end Operations | Malaysian Investment Development Authority | Ministry of Science, Technology and Innovation, Penang Development Corporation, Northern Corridor Implementation Authority |
| Expanding LED Packaging and Equipment | Malaysian Investment Development Authority | |
| Creating Local SSL Solid State Lighting Champions | Malaysian Investment Development Authority | Ministry of Science, Technology and Innovation, SME Corporation, Northern Corridor Implementation Authority, Ministry of Higher Education, Skill Development Centres, Ministry of Energy, Green Technology and Water |
| Building a Test and Measurement Hub | Malaysian Investment Development Authority | Agilent, Northern Corridor Implementation Authority |
| Expanding Wireless Communication and Radio Frequency Identification (RFID): <ul style="list-style-type: none"> • Expanding Wireless Radio Communications Providers • Growing Radio Frequency Identification | Northern Corridor Implementation Authority | Malaysian Investment Development Authority, Motorola, Penang Skills Development Centre, MIMOS |
| | Malaysian Communication and Multimedia Commission | IRIS, Department of Islamic Development Malaysia, Standards and Industrial Research Institute of Malaysia, Malaysia External Trade Development Corporation, Multimedia Development Corporation, Customs |
| Growing Automation Equipment Manufacturing | Malaysian Investment Development Authority | |
| Building Transmission and Distribution Companies | Ministry of Science, Technology and Innovation | Standards and Industrial Research Institute of Malaysia |
| Building a Home Appliance Manufacturing Hub and International Distribution Network | Pensonic | |

To ensure successful implementation, we see three imperatives:

- The Ministers of MITI and MOSTI will need to lead the effort to revitalise the Electrical & Electronic sector and bring together the multiple agencies involved;
- ETP Unit will serve as the E&E Central Facilitation Team (CFT) and facilitate the EPPs and enablers on the ground, coordinating the various initiatives and parties; and
- The private sector will need to work with the Government to push through specific EPPs and enabler projects and guide the development of the sector.

A governance structure, under the overall oversight of the Prime Minister, as depicted in *Exhibit 11-7*, will be set up to ensure that implementation timelines are met. This structure brings together both private companies and public parties on an ongoing basis.

Exhibit 11-7



The Ministers of MITI and MOSTI will need to lead the effort to revitalise the sector and bring together the multiple agencies involved. The Minister of International Trade and Industry will chair the monthly meetings of the Steering Committee with the Minister of Science, Technology and Innovation as Co-chair. The purpose of this committee will be to resolve strategic issues and update the Prime Minister every three months. Also on the Steering Committee will be the KSUs from both MITI and MOSTI as well as leading officials of other key agencies relevant to the E&E sector development, such as MIDA and Khazanah. Their representation on the Steering Committee will ensure that sector-wide and national interests are taken into account, while also providing a strong platform for ensuring the successful revitalisation of the E&E industry in Malaysia.

The CFT role will be played by the Economic Transformation Programme Unit (ETP Unit). It will need to facilitate the EPPs and enabler initiatives on the ground, coordinating the various initiatives and parties. This office will consist of the EPP focus area leaders and a small E&E central team. The EPP focus area leaders are directly responsible for the EPPs in their area (e.g. all solar-related EPPs will be under the purview of the EPP Solar Lead), and public or private sector individuals who have both the technical expertise and industry influence to help ensure its success will be seconded to the CFTETP Unit. Supporting them will be an E&E central team, whose role is to assist in coordinating all the EPPs in overlapping areas such as budget requests and state Government discussions. The E&E central team will also be continually looking for new E&E business opportunities.

An executive committee will be formed, made up of the EPP focus area leaders, the E&E central team coordinator, and an ETP Unit Director who will chair it. The Executive Committee will convene weekly to monitor progress, resolve operational issues and prepare for Steering Committee meetings.

The private sector will need to work with the Government to push through specific EPPs and enabler projects and guide the development of the sector. To align the efforts of the Government with global E&E trends, the private sector will be involved in two ways. First, an Advisory Council of CEOs comprising CEOs and MDs representing various sectors within E&E will be formed to advise the Steering Committee on the state of the industry. This Advisory Council will meet and update the Steering Committee quarterly. Second, individuals from the companies involved in specific EPPs will play an active part in the implementation teams to ensure delivery of the projects, resolve critical commercial issues and provide recommendations. These dedicated individuals will be part of the weekly ETP Unit meetings.

Box 9-1

| Summary of Electronic & Electrical NKEA | |
|--|-----------------------|
| • Incremental GNI impact in 2020 | RM53.4 billion |
| • Additional jobs in 2020 | 157,000 |
| <ul style="list-style-type: none"> • Critical targets and milestones within 6 to 12 months <ul style="list-style-type: none"> • One wafer fab set up • 4 integrated circuit design firms established • Multinational investment in test and measurement increased by 30 percent compared to 2010 | |