



Uweei

THE FUTURE MANUFACTURING AND PROMOTING SUSTAINABLE EMPLOYMENT

ISSUES AND CHALLENGES ON THE FUTURE
MANUFACTURING SUCH AS INDUSTRY 4.0 IN
SINGAPORE



SINGAPORE'S ECONOMIC PROFILE

- Singapore economy grew by 2% in 2016
- Based on advanced estimates, the economy would grow by 2.6 per cent in the first three months of 2017
- Unemployment rose to 2.3 per cent in March this year



MANUFACTURING SECTOR

- Manufacturing accounts for about a fifth of Singapore's GDP and more than 400,000 jobs
- Manufacturing output grew 11.9 per cent in November last year, compared with the same month in 2015
- Purchasing Managers' Index (PMI) - an indicator of manufacturing activity - for the electronics sector recorded its fifth straight month of expansion last month
- Driven largely by the electronics (semiconductors) and biomedical manufacturing clusters, even as transport engineering and general manufacturing continued to shrink

CHALLENGES FACED

- Ageing workforce
- Rising Unemployment
- Mismatch of skills
- Transformation of Industry
- Stagnant Productivity





STRATEGIES

- **Focusing on SMEs**

- SMEs contribute to nearly half of the GDP while employing 70% of the workforce
- SMEs Go Digital Programme to help companies build digital capabilities
- LEDs (Lean Enterprise Development Scheme) – More than 2000 companies, mostly SMEs, have responded to LEDS

- **SkillsFuture**

- More than 126,000 Singaporeans used it in its first year

- **Amendment of Re-employment Age**

- Re-employment age has been raised from 65 to 67 with effect from 1st July 2017
- Help older workers stay longer in the workforce should they wish to
- EAP has been raised from 3 months to 3.5 months



STRATEGIES

- **PCP Programs**

- Launched 36 new Professional Conversion Programmes (PCPs) to help more than 1,000 PMETs switch careers, and to take on job openings in these sectors that are still growing and hiring
- One of the new PCPs is for data analytics. One company was moving into smart manufacturing, and created new roles, such as data analysts. But at the same time, some of the existing jobs and staff were at risk of being let go.
- Instead of retrenchment, unions, companies and a training provider worked together to retrain redundant workers, who are mostly more than 40 years old. With professional conversion, these PMETs have moved into an emerging area with potential for career growth



COMMITTEE OF FUTURE ECONOMY (CFE)

- The Committee on the Future Economy (CFE) was convened in January 2016 to develop economic strategies for the next decade.
- Over 9,000 stakeholders, including trade associations and chambers (TACs), public agencies, unions, companies, workers, educators and students were consulted in this process.



CFE RECOMMENDATIONS

- Deepen and diversify international connections
- **Acquire and utilise deep skills**
- Strengthen enterprise capabilities to innovate and scale up
- Build strong digital capabilities
- Develop a vibrant and connected city of opportunity
- **Develop and implement Industry Transformation Maps (ITMs)**
- **Partner each other to enable innovation and growth**



ACQUIRE AND UTILISE DEEP SKILLS

- With the rapid pace of technological development, our workers will need to develop deep skills to stay relevant
- The SkillsFuture movement, launched in end-2014, gives Singaporeans a head-start in developing themselves throughout life, regardless of their starting points
- Learning throughout life needs to be our way of life, so we can quickly and easily adapt to new job demands, or even switch jobs or industries as the economy transforms
- Facilitate training and employment of workers via initiatives such as the Professional Conversion Programme and Career Support Programme



DEVELOP AND IMPLEMENT INDUSTRY TRANSFORMATION MAPS (ITMS)

- ITMs bring together industry partners, trade associations and chambers (TACs), unions, and public agencies to help each industry
- Continue to adopt a tailored approach for each industry so we are focused on where the potential can be best realised in each case

ELECTRONICS INDUSTRY TRANSFORMATION MAP STRATEGY



- *“Building the electronics industry of tomorrow”*

Transform & Grow

Transform existing
base and attract
new investments in
high value
components



Diversify:

Diversify into new
growth markets
through
developing new
solutions and
products

Electronics Industry Transformation Map

(A) INNOVATION

1. **Strengthen innovation ecosystem**
 - a) Convene multi-party innovation platforms
 - b) Foster one-to-one MNCs & SMEs/start-ups
 - c) Build up innovation infrastructure to support SMEs/startups
2. **Support companies to develop new capabilities**
3. **Develop new technologies for growth areas**

(B) PRODUCTIVITY

1. **Continue transforming industry to undertake high-VA activities**
 - a) Anchor high-VA mfg activities
 - b) Capture new growth areas
2. **Drive adoption of robotics & automation in needle-moving companies**
3. **Support companies in adopting advanced manufacturing technologies**

(C) JOBS & SKILLS

1. **Uplift image of Electronics sector**
2. **Grow pipeline of Electronics talent**
 - a) Groom new generation of talent
 - b) Attract & reskill Engineering talent
3. **Support continuous learning**
 - a) Develop Skills Framework for Electronics
 - b) Partner industry to identify future skills & training needs
 - c) Accelerate leadership development
 - d) Strengthen CET training provisions

(D) TRADE & INTNLN

1. **Provide access to overseas business opportunities**
2. **Help companies venture to new markets by capability upgrading**

HORIZONTAL ENABLER

- a) Strengthen SSIA's capabilities as key partner for industry development



PARTNER EACH OTHER TO ENABLE INNOVATION AND GROWTH

- Our unions too must continue to do their part to nurture a sense of ownership among workers and help them prepare for jobs of the future
- Unions must continue to work in concert with enterprises and the Government, move SkillsFuture forward and care for the well-being of all Singaporeans – especially those who may be more vulnerable in a rapidly-changing economy

INDUSTRY 4.0 – SINGAPORE'S STRATEGY



Enabling technological capability development



Investing in industry-aligned R&D for robotics and additive manufacturing

Technology roadmapping at the industry level

Transforming industries and enterprises



Driving i4.0 adoption through local research institutes

Developing industry transformation maps

Equipping our workforce with i4.0 capabilities



Responding to industry needs for capability development

Providing support through various fundings



ENABLING TECHNOLOGICAL CAPABILITY DEVELOPMENT

NATIONAL ROBOTICS PROGRAM A NATIONAL TECHNOLOGY ROADMAP FOR ROBOTICS
R&D AND ADOPTION

- Develop a globally competitive robotics industry with leadership in HMLV manufacturing, logistics and healthcare.
- Exploit advances in robotics technologies to enhance productivity and competitiveness of Singapore's manufacturing sectors.
- Support adoption of robotics to address local imperatives.

The screenshot shows a news article from The Straits Times. The main headline is "Singapore Budget 2016: More than \$450 million to support National Robotics Programme over next 3 years". Below the headline is a photograph of industrial robots working on solar panels. To the right of the main article, there is a sidebar with "ST VIDEOS" and three video thumbnails. The first video is titled "ST Budget Roundtable: Gearing up for the future a top priority". The second video is titled "Budget to build our future together: Heng Swee Keat". The third video is titled "Singapore Budget 2016: A look at the measures for individuals, families and the community" and features a "\$25 million" graphic.

Robots operating on solar panels at the module production line at REC Solar ASA manufacturing facility in Tuas. PHOTO: ST FILE

TRANSFORMING INDUSTRIES AND ENTERPRISES

\$4.5 BILLION INDUSTRY TRANSFORMATION PROGRAMME

(BUDGET 2016)



- Productivity (e.g. Automation)
- Manpower (e.g. SkillsFuture / Employee 4.0)
- Technology (e.g. R&D, Tech Roadmaps)
- Internationalization – go-to market strategies

Bespoke roadmaps for over 20 economic sectors in the works: Heng

As part of industry transformation scheme, a team of officers will serve each of the sectors that together account for over 80% of the economy

By Lee U Wen
leeuwen@spqr.com.sg
@LeeUwenST

Singapore
THE government will come up with bespoke plans for more than 20 economic sectors in Singapore to help them better meet the needs of the future economy, said Finance Minister Heng Swee Keat on Monday.

These industry transformation roadmaps, as they are called, will help the sectors boost productivity levels, invest more heavily in skills, drive innovation and promote internationalisation.

The roadmaps will have initiatives catered to the needs of companies within that specific industry, and will be adjusted when necessary to ensure they remain current and relevant. They are part of the new billion-dollar Industry Transformation Programme (ITP) that was announced by Mr Heng at last week's Budget. The ITP is a \$4.5-billion package targeted at providing support to firms and industries while driving innovation.

A team of officers will be set up to serve each of the 20-plus sectors, which collectively account for more than 80 per cent of the economy. They include logistics, precision engineering, tourism, retail and food & beverage.

The officers will come from government agencies such as the Economic Development Board, Spring Singapore, International Enterprise Singapore, the Agency for Science, Technology and Research, and the Workforce Development Agency.

These officers, known as "cluster champions", will be the primary point of contact for the sector and they will actively engage the trade associations and companies.

"We will systematically go through sector by sector, all the different plans. We need to bring everyone together," said Mr Heng after tak-



(Left to right) Dr Koh, Mr Heng, Singapore Precision Engineering & Technology Association adviser Steven Koh and Precision Singapore general manager Sam Choo Wah at a tour of the local precision engineering firm based in Marsiling industrial estate. PHOTO: LIM SWEN HONG/STRAITSTIME.COM

ing the promises of Ferrarini & Sognare, a local precision engineering firm based in Marsiling industrial Estate.

Mr Heng, who is also the chair of the Committee on the Future Economy, was speaking at the media for the first time since delivering the Budget statement in parliament last Thurs-

day.
He stressed that while the ITP is still in an inception and mainly central to develop and maintain a strong partnership between companies, government agencies, and industry associations and business chambers.

"If we can do this well, we will feel much more competitive, pro-

ductive and innovative industries. All the industries coming together will then create a much more vibrant economy," he said.

"In that way, we can create better jobs for the people, and better opportunities for many other companies to start up in Singapore."

The minister shared that the gov-

ernment already has elements of all the different plans in place, be it in the training of staff, making use of technology, and ways to raise productivity.

"What we need to do is to integrate these plans into a coherent one, where the different parts can come together. We need to bring industry associations as well as companies, big or small, together. Then, we can have a much better alignment of our efforts," he added.

When asked when the industry transformation roadmaps would be ready, Mr Heng said that the logistics and precision engineering sectors were among those where discussions were already at a "more advanced stage".

Minister of State for Trade and Industry Koh Poh Koon, who was also part of the delegation that visited Ferrarini, said that his ministry placed a certain focus on the precision engineering sector because it accounts for \$5.6 billion of the industry's value-add.

"That comes to nearly 18 per cent of Singapore's manufacturing value-add, or 2.6 per cent of our GDP (gross domestic product) in 2014," said Dr Koh.

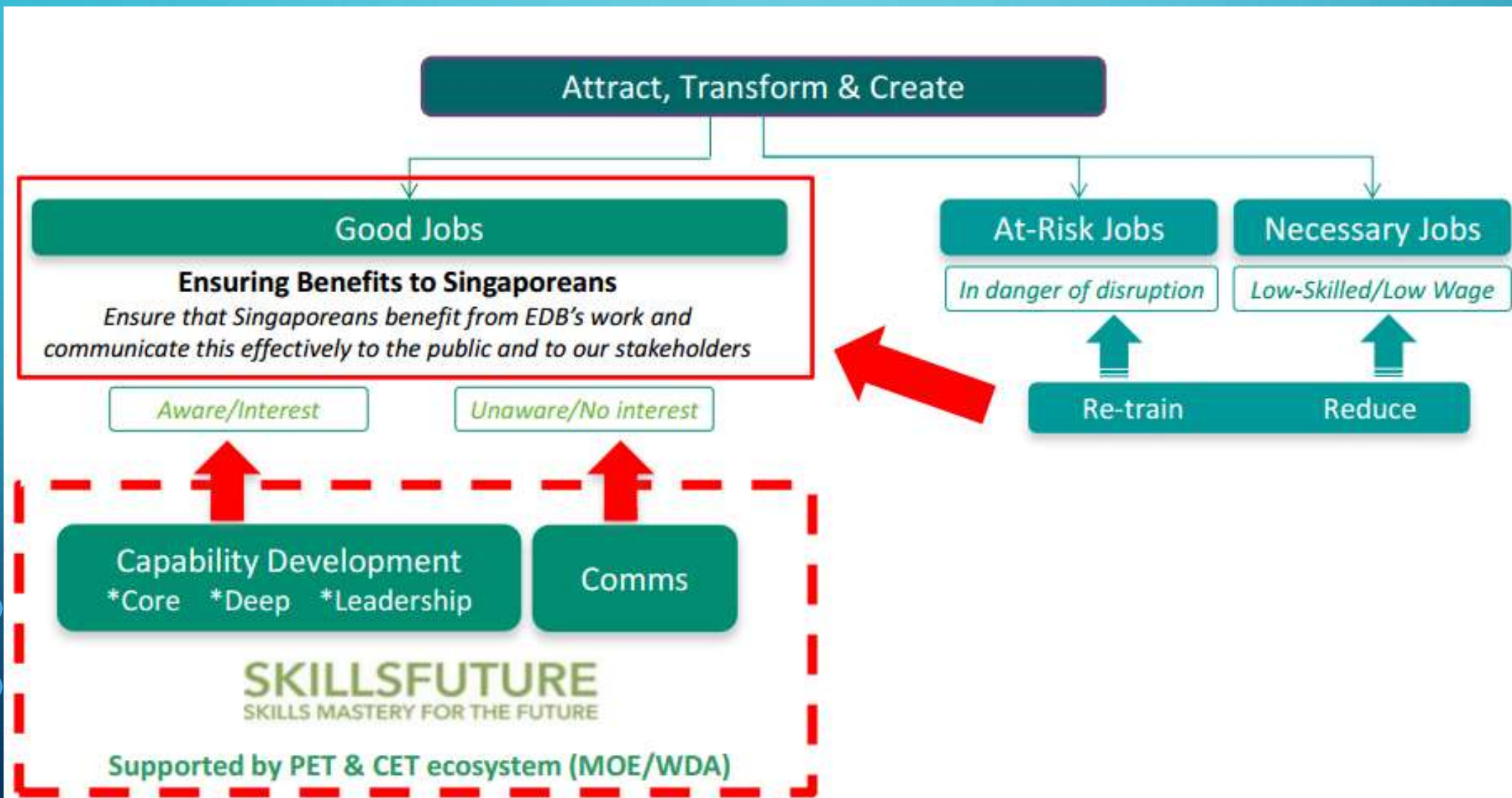
The sector employs some 94,000 people, or about one out of every four manufacturing jobs. It also brings about \$594,000 in terms of value-add per worker.

Dr Koh noted that the sector's compound annual growth rate from 2008 to 2014 was 3.5 per cent, more than double the 2.3 per cent in the 2002-2008 period.

"That kind of growth has allowed our precision engineering sector to close the value-add gap between Singapore and the more advanced economies like Japan, Germany and the United States," he said.

"Precision engineering is obviously one area that we do want to put an emphasis on, to ensure that the industry continues to transform."

EQUIPPING OUR WORKFORCE WITH I4.0 CAPABILITIES



CASE STUDY 1 – INFINEON

INFINEON INVESTS S\$105 MILLION IN SMART FACTORY

- Manufactures chips used in things like cars and electronic identification such as passports
- Robot like automated guided vehicles, to facilitate the transportation of chips across different parts of the facility
- These investments are expected to help the company achieve chip output of four times more





SENTIMENTS TOWARDS AUTOMATION

“For the lots delivery, it used to be carried out manually by the operator who has to search the lots and carry the lot and hand it to the equipment. But today, employing automation, the lot will be automatically delivered to the operator and after that we have robotic vehicles that automatically come over and transport the lots to the equipment.”

Senior Engineer, Mr Foo

“The move towards automation and connectivity has been seamless so far. It has been easy, because the company provides the necessary training”

Employee, Ms Ha

“It contributes to our sustainable competitive positioning in the market. Smart Enterprise Programme gives us a quantum leap in productivity. This is also very beneficial to our workers, because we replace a lot of the manual, error-prone activities by our workers, and this allows us to upgrade our workers into much higher value added activities.”

Managing Director, Mr Chong



THANK YOU

