

INDUSTRIAL INSIGHTS REPORT

Issue: 4/2019



MINISTRY OF HUMAN RESOURCES



HRDF
MALAYSIA

HRDF

Human Resources
Development Fund

- Petroleum & Gas Extraction
- Petroleum Refineries
- Manufacturer of Miscellaneous Products of Petroleum & Coal



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- 2 PETROLEUM & GAS EXTRACTION
- 3 PETROLEUM REFINERIES
- 4 MANUFACTURER OF MISCELLANEOUS PRODUCTS OF PETROLEUM & COAL



Summary COMPARISON

WHAT'S INSIDE

HRDF Industrial Insights Report is intended to share the latest training related updates and insights for various industries in Malaysia. This report will be crucial for HRDF and other associated stakeholders to learn from the present issues and work towards improving the nation's human capital development. This report will highlight the general industry outlook, training trends under HRDF and employers' qualitative feedback. This report covers the importance of the industry, training overview, industry demographics, related skill areas, academic qualifications for the current workforce, training challenges and their impacts.

Instead of taking the traditional social science research approach, this report adopted an action research approach inspired by Kurt Lewin's process, with the aspiration of inducing changes in HRDF to better meet the changing needs of employers registered under HRDF. Using HRDF's internal data as well as selected employer's qualitative feedback, insights and recommendations will be provided for the reader's enlightenment.

Nevertheless, it should be noted that since the content of this report is confined to the context of the selected HRDF subsectors and their registered employers, there is a limitation on the extent of how the contents can be generalised to the overall industries.

This report focuses on the following three (3) industries:



Petroleum & Gas Extraction



Petroleum Refineries



Manufacturer of Miscellaneous Products of Petroleum & Coal

QUICK TAKEAWAYS AND HIGHLIGHTS

- Contents on industry outlook:
- Industry Outlook
 - Subsector in HRDF
 - Training Overview
 - HRDF Levy Schemes
 - Course Fees
 - Skill Areas
 - Training Needs
 - Challenges in Training
 - HRDF Levy Utilisation
 - Industry 4.0 relate to Subsector

INDUSTRY OUTLOOK AT GLANCE



2017: Overall Gross Output Value

- Extraction of crude petroleum & natural gas contributed 90.8% towards the overall gross output value

RM138.6 billion

(Source: Annual Economic Statistics 2018 Mining of Petroleum and Natural Gas, Department of Statistics Malaysia (as at 28 Feb 2019))



2017: Total Numbers of Engaged Workers

36,776 persons

(2015: 41,698 persons)

33% (12,254 persons)
under HRDF coverage
(HRDF data as at 2018)

(Source: Annual Economic Statistics 2018 Mining of Petroleum and Natural Gas, Department of Statistics Malaysia (as at 28 Feb 2019))

Future opportunities of Oil & Gas Activities in Malaysia:



Upstream (Field Exploration, Development & Production)



Midstream (Transportation (Pipelines & Tankers))



Downstream (Terminal/ Regasification)

Diversifying Downstream:

- Pengerang Integrated Petroleum Complex (PIPC) in Johor.
- Refinery and Petrochemical Integrated Development (RAPID) in Pengerang, Johor.

PETROLEUM & GAS EXTRACTION IN HRDF

FACT 1: HRDF registered employers covered under Petroleum & Gas Extraction are located at only six (6) states in Malaysia for 2018.



30
Employers



12,254
Employees

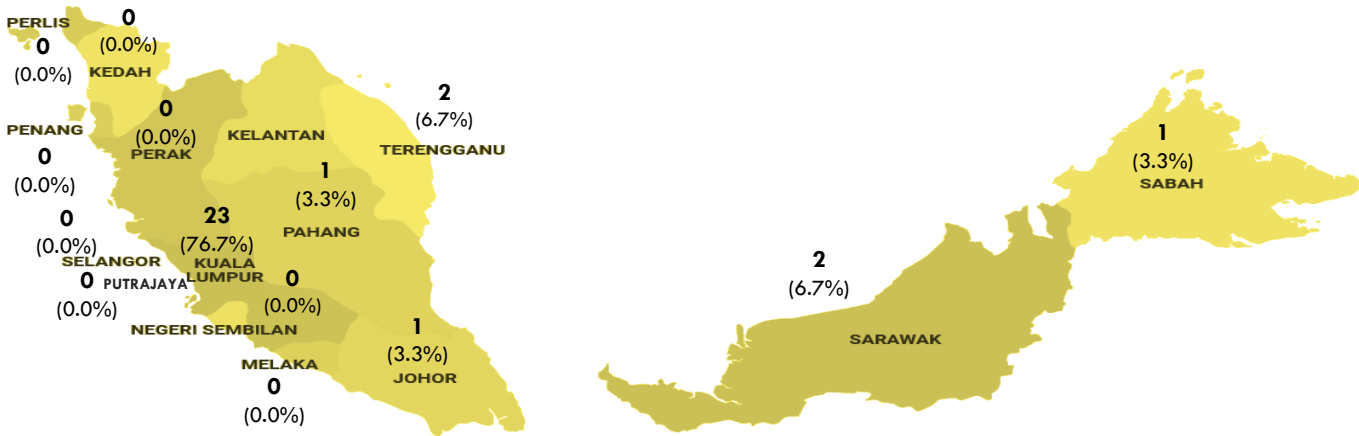


RM11,948,486
Levy Collection



72.4%
Levy Utilisation

NUMBER OF HRDF REGISTERED EMPLOYERS ACCORDING TO STATES IN 2018



Quick Takeaways & Highlights

Number of Establishments registered in Malaysia:

157

(Source: Various Economic Census 2016 Report, Department of Statistics)

2018: HRDF covered **19%** of the total establishments registered in Malaysia.

30

26.7% Large establishments

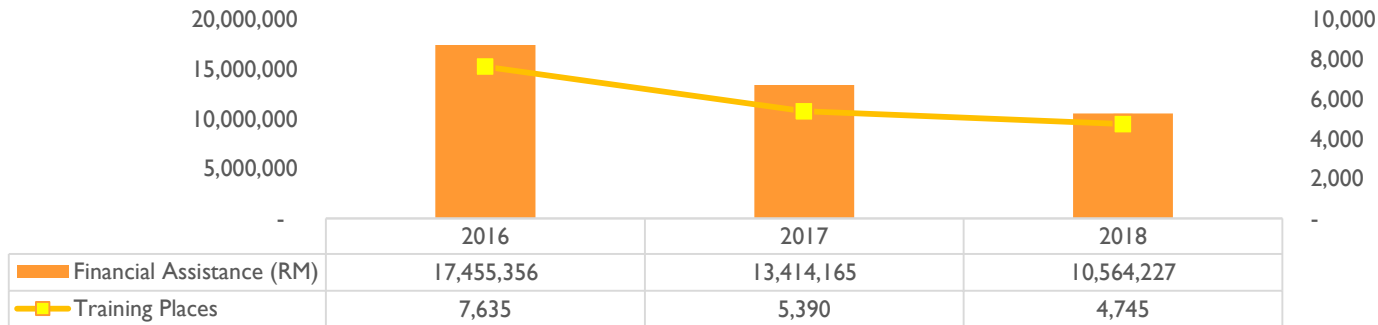
73.3% SME establishments

(Source: HRDF administrative data as at 2018)

Chapter 2: PETROLEUM & GAS EXTRACTION

TRAINING OVERVIEW

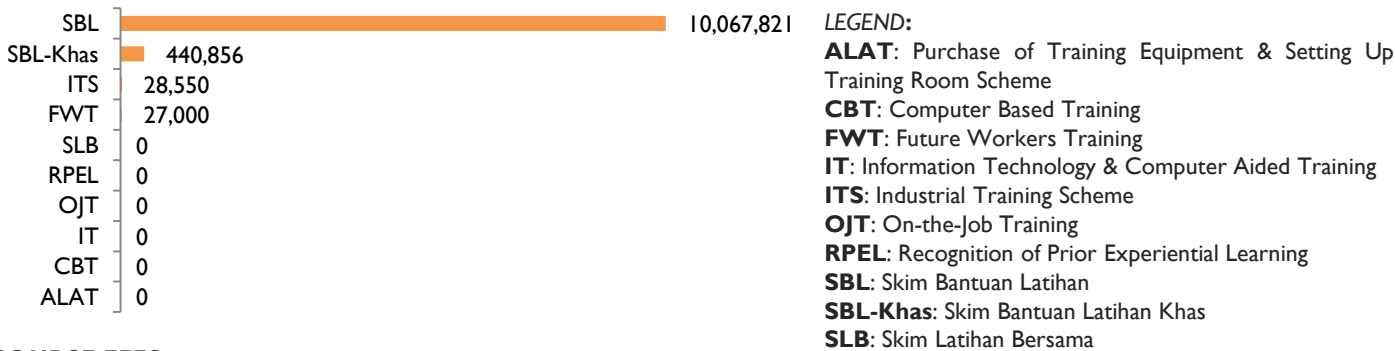
FACT 2: Training places and financial assistance approved has reduced for three (3) consecutive years.



HRDF LEVY SCHEMES

FACT 3: Skim Bantuan Latihan (SBL) is the most utilised scheme by Petroleum & Gas Extraction employers in 2018.

Financial Assistance Approved (RM) according to HRDF Schemes in 2018



COURSE FEES

FACT 4: The most expensive training programme conducted by Petroleum & Gas Extraction employers is Rigging, Slings and Lifting course.

Training Programmes Approved with Highest Cost (RM per day/ per pax)

1. Advanced Rigging, Slings and Lifting RM1,300 (2 days)
2. Advanced Turnaround, Shutdown & Outage Management RM1,300 (3 days)
3. Agile Practitioner RM1,300 (3 days)

Training Programmes Approved with Medium Cost (RM per day/ per pax)

1. CompTIA Security RM788 (5 days)
2. Modul Kendalian Pencawang 11KV RM780 (5 days)
3. T-BOSIET Training RM778 (6 days)

Training Programmes Approved with Lowest Cost (RM per day/ per pax)

1. Defensive Driving Course (RM31)
2. Tropical Bosiet with EBS and Travel Safely by Boat (RM29)
3. Designated First Aider Course (RM18)

Quick Takeaways & Highlights

- The investment of training (financial assistance) and training places approved for Petroleum & Gas Extraction industry has decreased over the three (3) consecutive years.
- The scenario happened might be affected due to a wave of cost reduction strategies/tactics among upstream businesses. Many cost-cutting initiatives implemented and encouraged mergers & acquisitions. Indeed, the declining global crude oil price has led the Oil & Gas companies to prepare themselves by optimising operations, improving efficiency and reducing costs to sustain profitability.

(Source: Malaysian Investment Development Authority (MIDA))

Chapter 2: PETROLEUM & GAS EXTRACTION

SKILL AREAS

FACT 5: Safety & health is the highest skill areas trained by Petroleum & Gas Extraction in 2018.

	Skill Area	Training Places
1	 Safety & Health	2,016
2	 Management or Strategic Management	551
3	 Supervisory	387
4	 Process & Operation	292
5	 Engineering	270

	Skill Area	Financial Assistance (RM)
1	 Safety & Health	3,592,501
2	 Engineering	1,583,113
3	 Management or Strategic Management	1,473,356
4	 Process & Operation	1,042,396
5	 Maintenance or System And Control	568,041

EMPLOYERS FEEDBACK ON TRAINING NEEDS

FACT 6: Communication skills training required by all level of workers.

MASCO	TECHNICAL	NON-TECHNICAL
Skilled Workers	1. Geophysical Techniques 2. Mathematical and Computer Skills 3. Redefining Pipe Stress Analysis 4. Engineering Project Coordinator 5. Surveyor Skills	1. Management Skills 2. Communication Skills 3. Team Building 4. Leadership Skills 5. Safety and Health
Semi-Skilled Workers	1. Machine Operating 2. OPITO (BOSIET etc.) 3. Assembler Skills	1. Communication Skills 2. Human resource Skills 3. Team building 4. Accounting Skills 5. Administration Skills
Low Skilled Workers	1. Basic Technician 2. Computer Skill 3. Forklift Training 4. Machine Operating	1. Team building 2. Cleaning Skills 3. Communication Skills 4. Security 5. Microsoft Office

Quick Takeaways & Highlights

- Safety and Health become the highly in demand courses and skills that have been trained in for the past two (2) years in 2017 and 2018.
- The nature of work in upstream, downstream as well as midstream of this industry, requires them to comply with the Occupational Safety & Health Administration (OSHA). In fact, the training has been mandatory for the workers involved in the risk activities and as a requirement to complete the training before performing their jobs.

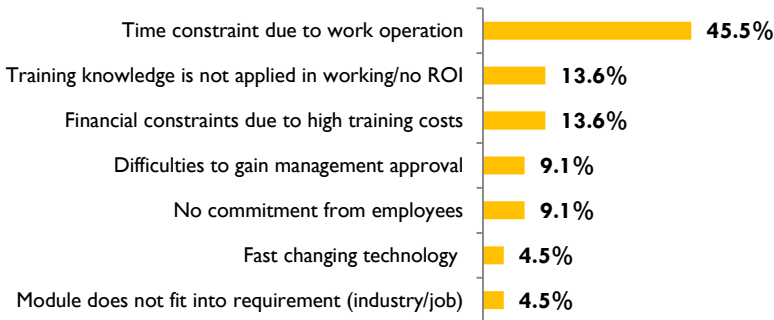
Chapter 2: PETROLEUM & GAS EXTRACTION



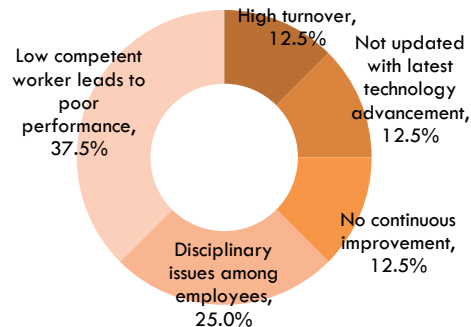
CHALLENGES IN TRAINING

FACT 7: Time constraint is the main challenge in conducting training for Petroleum & Gas Extraction industry.

Top 5 Challenges in Conducting Training



Negative Impacts with no Training



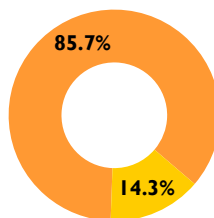
UTILISATION OF HRDF LEVY

FACT 8: Among the 85.7% of employers, most of them sent their employees for Technical training.

Reasons for Active Use

- ✓ Technical training is a requirement for employees to attend
- ✓ Employers' responsibility to develop staff
- ✓ To maximise the training fund utilisation

Active Less Active



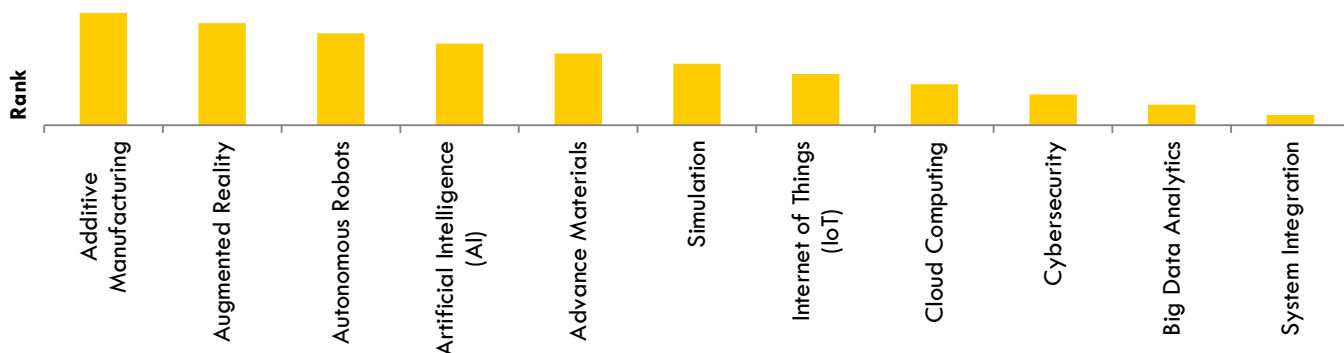
Reason for Less Active Use

- ✓ Training available is too general, not customised according to individual needs

INDUSTRY 4.0 FOR PETROLEUM & GAS EXTRACTION

FACT 9: Additive Manufacturing is ranked as the most important pillar for Petroleum & Gas Extraction.

Petroleum & Gas Extraction Employers' Feedback on the Importance of Industry 4.0



Quick Takeaways & Highlights

- About 45.5% of the employers responded to the study in Petroleum & Gas Extraction which viewed the main constraint of sending their staff for training is due to tight work operations. However, the failure of sending their staff for upskilling and reskilling activities may lead to poor performances as a result of low competent workers viewed by 37.5% respondents from the same industry.
- As for IR4.0 for Petroleum & Gas Extraction, the oil and gas industry use many complex machineries that must meet robust performance and environmental standards. Additive manufacturing is viewed as the most important pillar in IR4.0 as this allows the innovative shapes and complex geometries that reduce the number of parts, thereby reducing assembly time, improving performance and improving emission reduction.



INDUSTRY OUTLOOK AT GLANCE



2017: Value Added of Petroleum and Natural Gas	
Extraction of crude petroleum and natural gas	RM107.7 billion
Support activities for petroleum and natural gas extraction	RM7.1 billion

(Source: Annual Economic Statistics 2018 Mining of Petroleum and Natural Gas, Department of Statistics Malaysia (as at 28 Feb 2019))

Examples of Refined Products from Crude Oil

- Liquefied Petroleum Gas
- Lubricating Oils
- Gasoline
- Kerosene
- Aviation Fuel
- Feedstock for petrochemical industry
- Diesel Fuel
- Fuel Oils

Export & Future Market for Malaysia's Refined Petroleum Products

2019: accounted for **5.9%** of total exports

RM5.0 billion (Y-o-Y +16.2%)

Export

(Source: Press Release Malaysia External Trade Statistics March 2019, Department of Statistics Malaysia (as at 3 May 2019))

To become **net oil product exporter**

Pengerang Integrated Petroleum Complex (PIPC) in Johor

Sipitang Oil & Gas Industrial Park (SOGIP) in Sabah

Established to **double** refining capacity

(Source: U.S. Department of Commerce's International Trade Administration (<https://www.export.gov>))

PETROLEUM REFINERIES IN HRDF

FACT 1: The Petroleum Refineries industry expanded up to 98.1% of the total levy collected where majority of the companies were located at Central region.

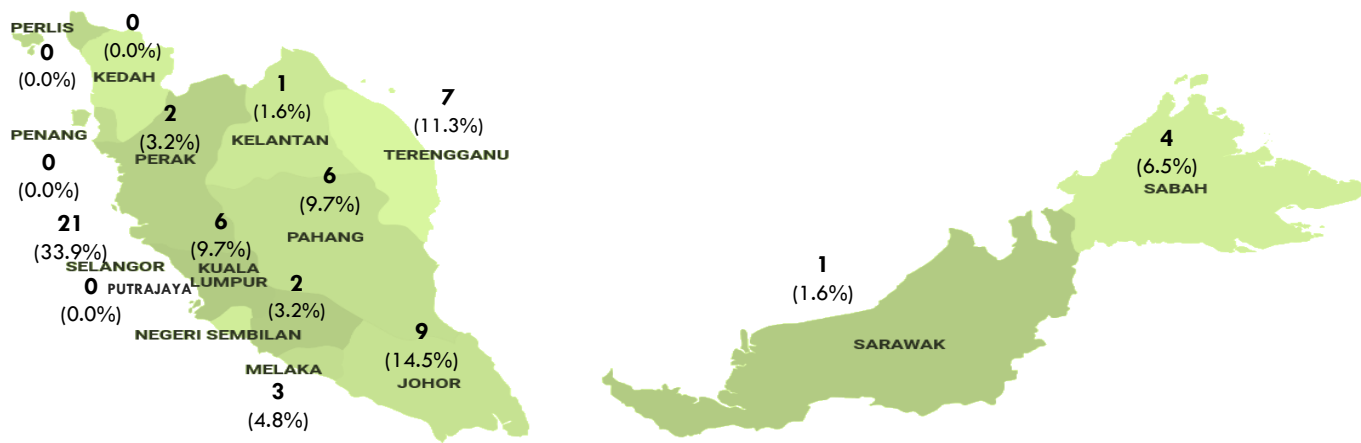
62 Employers

13,483 Employees

RM103,462,028 Levy Collection

98.1% Levy Utilisation

NUMBER OF HRDF REGISTERED EMPLOYERS ACCORDING TO STATES IN 2018

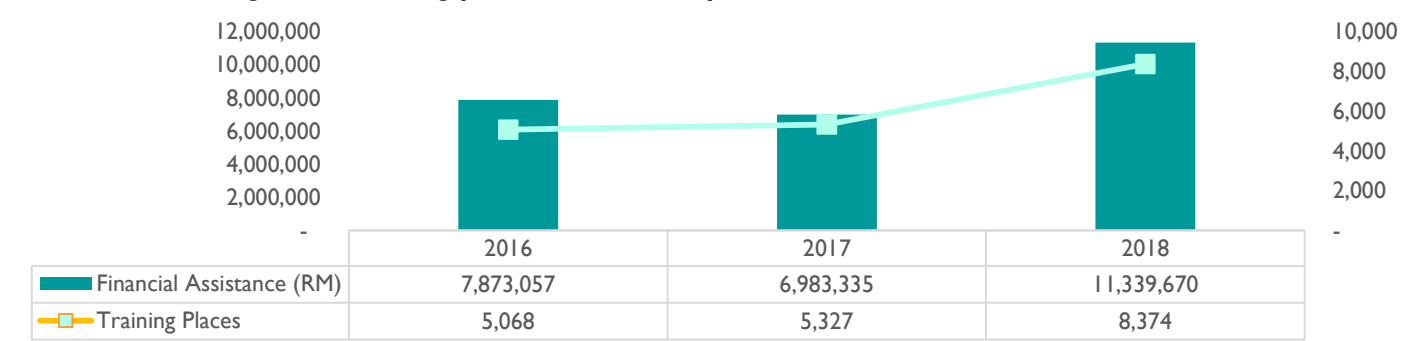


Quick Takeaways & Highlights

There were 62 establishments with 13,483 employees in Petroleum Refineries Industries registered with HRDF. Of the total establishments, 33.9% were located at the Central region followed by Terengganu (Kerteh area) and Johor (Pengerang area) with 14.5% and 11.3% respectively.

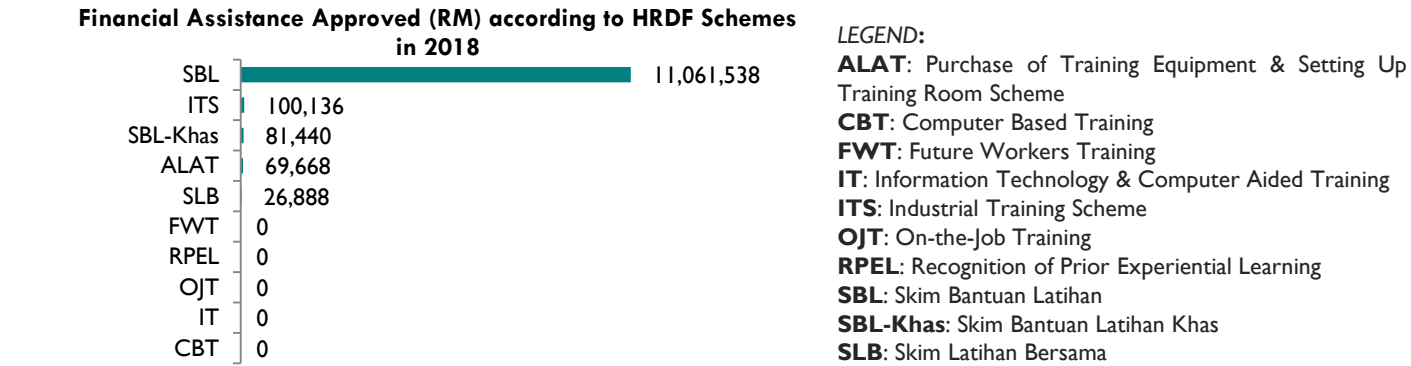
TRAINING OVERVIEW

FACT 2: The training trend (training places) increased by 57.2% from 5,327 (2017) to 8,374 (2018).



HRDF LEVY SCHEMES

FACT 3: Financial assistance approved of RM100,136 for internships under Industrial Training Scheme (ITS) in 2018.



COURSE FEES

FACT 4: Safety and Health programmes remain to be paramount in this industry.

- Training Programmes Approved with Highest Cost (RM per day/ per pax)**
1. Project Time Management RM1,300 (1 day)
 2. Project Risk Management RM1,300 (1 day)
 3. Certificate in Termination & Dismissal RM1,272 (1 day)
- Training Programmes Approved with Medium Cost (RM per day/ per pax)**
1. HSE Program and Reporting RM790 (1 day)
 2. Environmental Aspects, Impact and Risk Assessment RM750 (1 day)
 3. Radiation Safety Awareness RM730 (2 days)
- Training Programmes Approved with Lowest Cost (RM per day/ per pax)**
1. Seminar on Environmental Quality (Clean Air) RM300 (3 days)
 2. Malacca OSH Seminar 2018 RM300 (1 day)
 3. Oil and Gas Safety Passport RM250 (2 days)

Quick Takeaways & Highlights

This industry was active in utilising their HRD levy as they have their own technical training institute called Institut Teknologi Petroleum PETRONAS (INSTEP). 7% of total training places in year 2018 consist of this institute. Apart from that, 80% of the training were conducted as inhouse.

SKILL AREAS

FACT 5: The course fee for Engineering programmes were expensive compared to the course fee for Safety and Health programmes.

	Skill Area	Training Places
1	 Safety & Health	1,838
2	 Engineering	1,681
3	 Team Building or Motivation	579
4	 Management or Strategic Management	522
5	 Process and Operation	425

	Skill Area	Financial Assistance (RM)
1	 Engineering	2,801,540
2	 Safety and Health	1,303,564
3	 Process and Operation	771,690
4	 Team Building or Motivation	698,884
5	 Management or Strategic Management	342,684

EMPLOYERS FEEDBACK ON TRAINING NEEDS

FACT 6: Engineering and Safety and Health were the top rated skills needed within this industry.

MASCO	TECHNICAL	NON-TECHNICAL
Skilled Workers	1. Engineering 2. Operation Management 3. Technical Support Engineer 4. Welding	1. Leadership Skills 2. Human Resources 3. Problem Solving & Decision Making 4. Marketing Skills 5. Financial
Semi-Skilled Workers	1. Operational Assistant 2. Site Technician	1. Communication Skills 2. Sales and Marketing Skills 3. SS 4. Customer Service Skills
Low Skilled Workers	1. Technician 2. Packaging 3. Filing 4. Driving	1. Safety and Health 2. Communication Skills 3. Customer Service Skills

 Quick Takeaways & Highlights

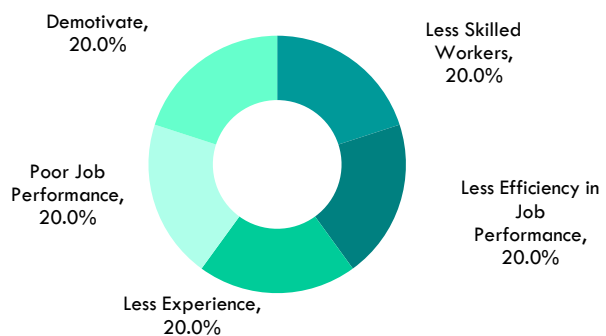
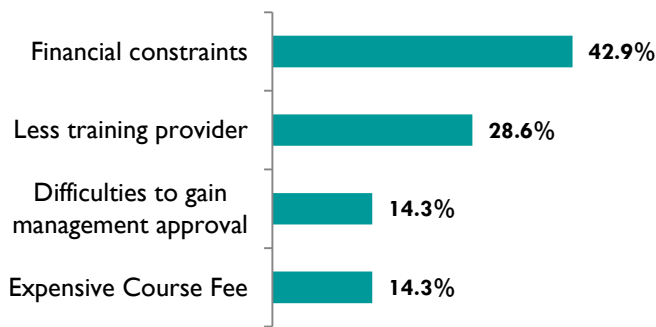
The findings indicated that employers within this subsector require their employee to be well-rounded in Engineering and Safety and Health. Chemical engineering process is one of the critical skill needed to transform crude oil into other useful products. At the same time, they need to reduce the accidents at the plant.

CHALLENGES IN TRAINING

FACT 7: The biggest challenge highlighted was “budget constraint” due to the expensive course fee.

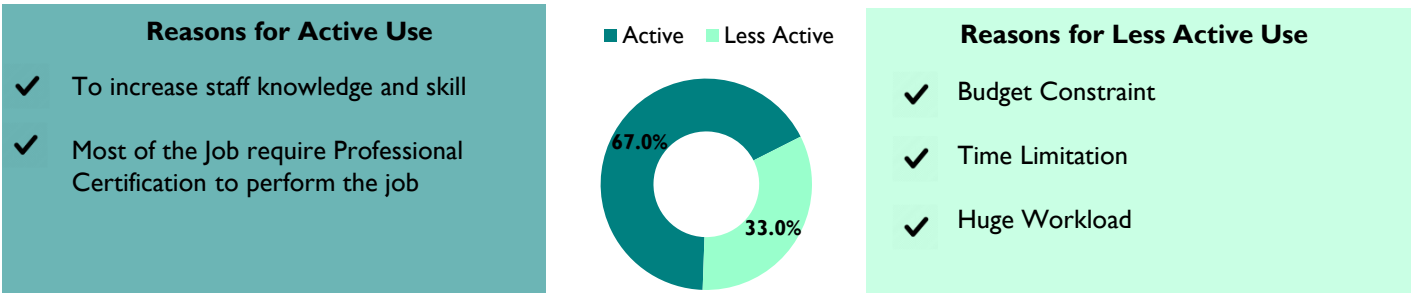
Top 5 Challenges in Conducting Training

Negative Impacts with no Training



UTILISATION OF HRDF LEVY

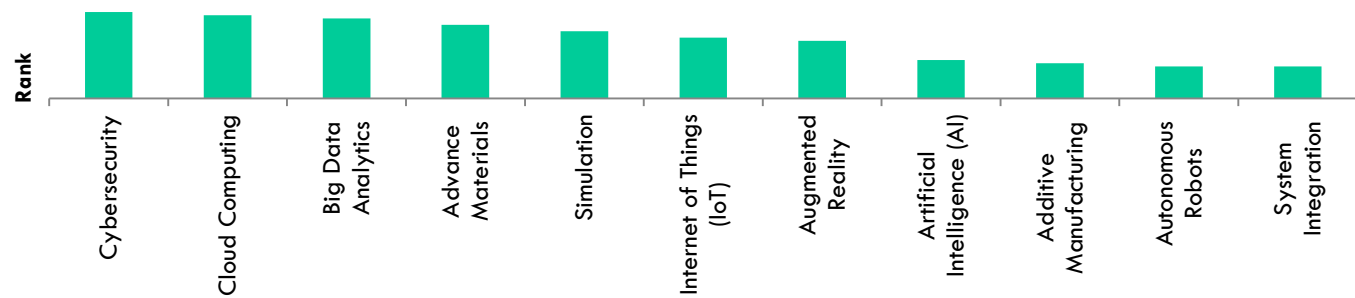
FACT 8: 67.0% of the respondents cited that they were actively using their HRDF levy.



INDUSTRY 4.0 FOR PETROLEUM REFINERIES

FACT 9: The registered employers in Petroleum Refineries subsector required their employees to be skilled in Cybersecurity, Cloud Computing and Big Data Analytics areas to support emerging innovations.

Petroleum Refineries Employers' Feedback on the Importance of Industry 4.0



Quick Takeaways & Highlights

The findings indicated that budget constraint was one of the major challenge faced by the employers as most of them opted for the technical training (engineering and safety and health areas) that has a higher course fee.

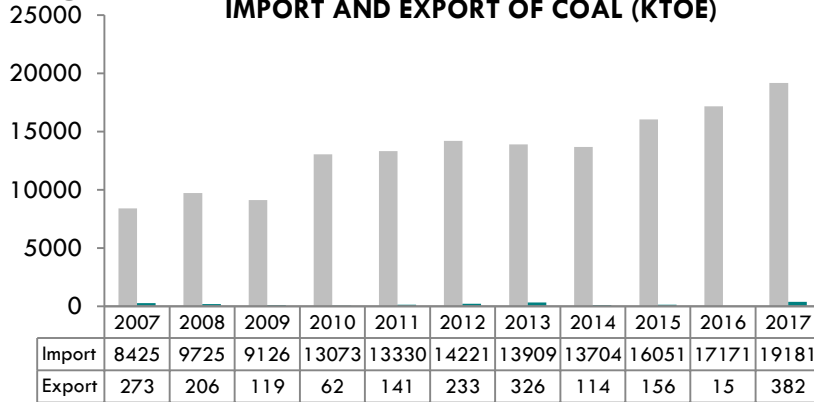
Chapter 4: MANUFACTURER OF MISCELLANEOUS PRODUCTS OF PETROLEUM & COAL



OUTLOOK OF COAL INDUSTRY IN MALAYSIA

FACT 1: Malaysia is one of the major importers of coal due to the rising demand.

IMPORT AND EXPORT OF COAL (KTOE)



- ✓ Most of the coal supplies imported from Indonesia (62%), Australia (24%).
- ✓ Coal is more economically competitive than natural gas for power generation feedstock. Fuel switching from natural gas to coal has gained attraction in Peninsular Malaysia, spurring utilities and power companies to develop more coal-fired capacity by 2020.

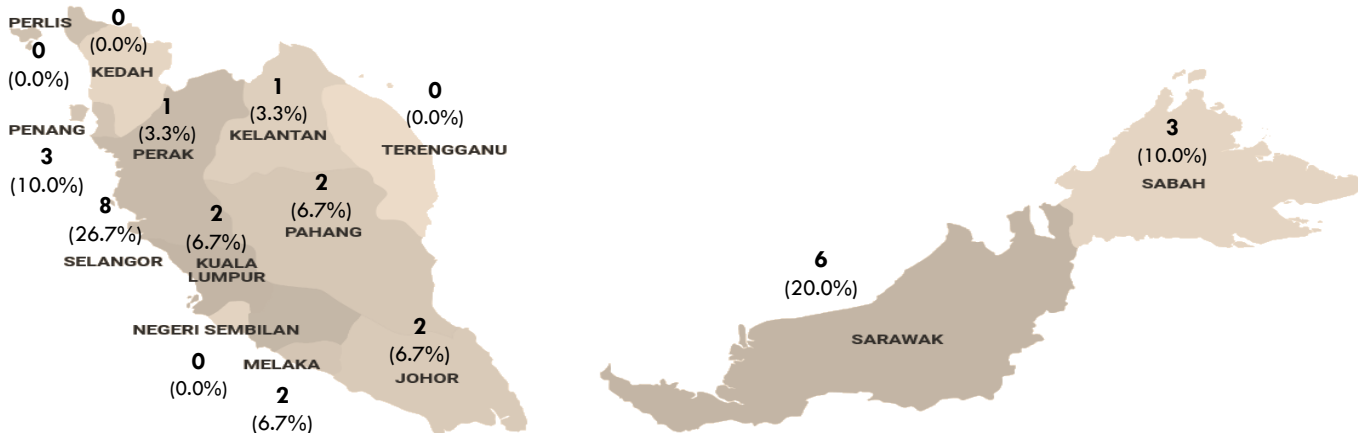
(Source: Malaysia Energy Information Hub, Energy Commission (<https://meih.st.gov.my/statistics>); 'Coal rally a headache for Malaysia power firms', TheStarOnline (22 Oct 2018); Economic Country Analysis Brief: Malaysia, U.S Energy Information Administration, 2017)

MANUFACTURER OF MISCELLANEOUS PRODUCTS OF PETROLEUM & COAL IN HRDF

FACT 3: Selangor has the highest number of registered employers followed by Sarawak.



NUMBER OF HRDF REGISTERED EMPLOYERS ACCORDING TO STATES IN 2018



Quick Takeaways & Highlights

Malaysia – One of the major importers of coal. Coal is the main source of energy and accounts for 46% of electrical energy generation.

There were 30 establishments with 1,805 employees from Manufacturer of Miscellaneous Products of Petroleum & Coal Industries registered with HRDF. Of the total establishments, 26.7% located in Selangor, followed by 20.0% in Sarawak. 11

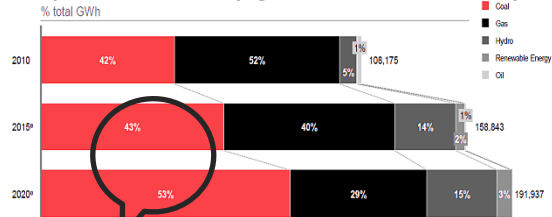
ENERGY MATRIX & CHALLENGES

FACT 2: Malaysia's energy matrix is becoming more carbon-heavy.

11th MP prioritised to reduce dependency on fossil fuels for electricity generation

optimising fuel mix exploring alternative fuels

Expected electricity generation mix in Malaysia



Main source of electrical energy generation (46%) due to lower market prices & rising natural gas prices

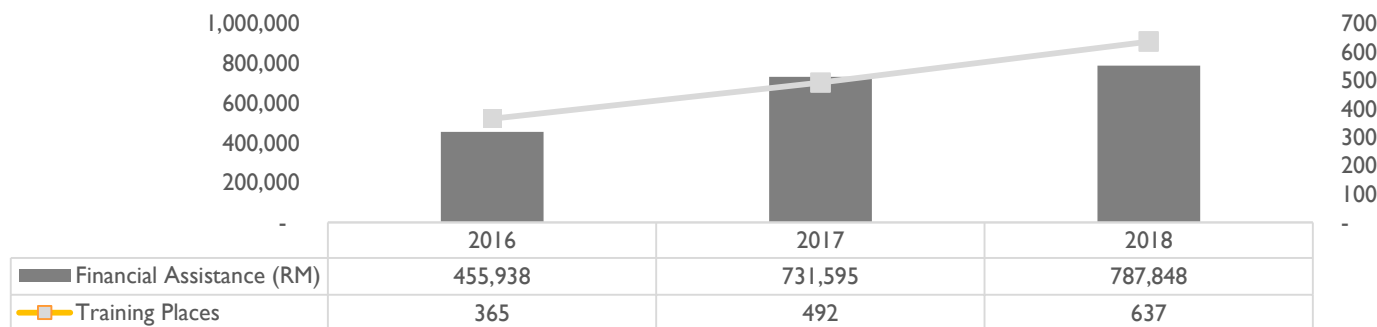
Electrical energy generation from renewable sources (< 1%)

(Source: 11th Malaysia Plan, 2015; Mid-term Review of 11th MP, 2018; de Oliveira, R., Powering the future: Malaysia's energy policy challenges, IDEAS(Policy No.55), 2018)

Chapter 4: MANUFACTURER OF MISCELLANEOUS PRODUCTS OF PETROLEUM & COAL

TRAINING OVERVIEW

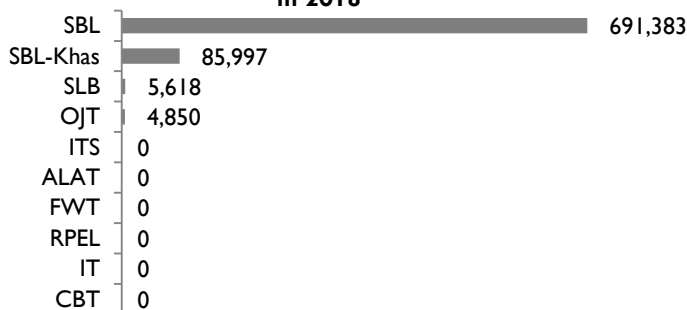
FACT 4: Financial Assistance and Training Places have increased for the three (3) consecutive years.



HRDF LEVY SCHEMES

FACT 5: Only RM4,850 financial assistance approved for On-the-Job Training (OJT).

Financial Assistance Approved (RM) according to HRDF Schemes in 2018



LEGEND:

ALAT: Purchase of Training Equipment & Setting Up Training Room Scheme
CBT: Computer Based Training
FWT: Future Workers Training
IT: Information Technology & Computer Aided Training
ITS: Industrial Training Scheme
OJT: On-the-Job Training
RPEL: Recognition of Prior Experiential Learning
SBL: Skim Bantuan Latihan
SBL-Khas: Skim Bantuan Latihan Khas
SLB: Skim Latihan Bersama

COURSE FEES

FACT 6: Measurement and Calibration training is the most expensive course for Manufacturer of Miscellaneous Products of Petroleum & Coal.

Training Programmes Approved with Highest Cost

1. A Practical Approach to Measurement and Calibration RM1,300 (2 day)
2. Successful Project Management RM1,300 (2 day)
3. Loading Master Certificate RM1,300 (3 day)

Training Programmes Approved with Medium Cost

1. Identify with Window Server 2016 RM700 (5 day)
2. Doing Business in The Age of Disruption RM700 (2 day)
3. Writing Effective Meeting Minutes RM700 (1 day)

Training Programmes Approved with Lowest Cost

1. Hands-on Training on National Registry of Certified Environmental Professional (NRCEP) System RM200 (1 day)
2. Microsoft Excel 2016/2013 Advanced RM200 (2 day)
3. Budget 2019 On Business, Personal Investment And Tax Planning RM50 (1 day)

Quick Takeaways & Highlights

Manufacturer of Miscellaneous Products of Petroleum & Coal industry is only active in Skim Bantuan Latihan (SBL), Skim Bantuan Latihan Khas (SBL-Khas), Skim Latihan Bersama (SLB) and On-the-Job Training (OJT) with total 637 training places in 2018.

Chapter 4: MANUFACTURER OF MISCELLANEOUS PRODUCTS OF PETROLEUM & COAL

SKILL AREAS

FACT 7: Safety and Health remain as the top skill areas focused by this industry in 2017 and 2018.

	Skill Area	Training Places
1	 Safety & Health	166
2	 Quality and Productivity	73
3	 Legal and Law	59
4	 Computer or Information and Technology	47
5	 Management or Strategic Management	45

	Skill Area	Financial Assistance (RM)
1	 Safety & Health	134,141
2	 Engineering	87,905
3	 Management or Strategic Management	84,024
4	 Process & Operation	80,931
5	 Maintenance or System And Control	44,514

EMPLOYERS FEEDBACK ON TRAINING NEEDS

FACT 8: Risk Management is needed for Non-Technical Low Skilled Workers.

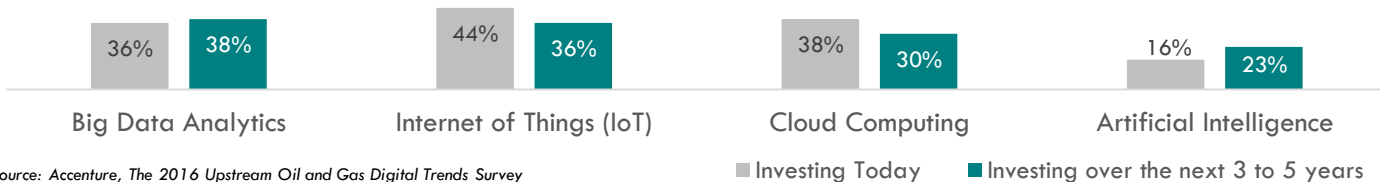
MASCO	TECHNICAL	NON-TECHNICAL
Skilled Workers	- Service and maintenance - Engineering - Information and technology	- Leadership Skills - Communication Skills - Problem Solving - Report Writing - Consultancy Skills
Semi-Skilled Workers	- Computer Skills - Fire Safety - Well-site Supervisory - Drilling	- Communication Skills - Administration Skills - Service skills - Problem Solving - Reporting Skills
Low Skilled Workers	- Forklift Drivers - Logistic - Handling material	- Risk Management - Team Building

(Source: Skills needs in the energy industry, Energy Institute, Deloitte and Norman Broadbent)

INDUSTRY 4.0 FOR OIL AND GAS INDUSTRY

FACT 9: Internet of Things (IoT) is said as the most important in IR4.0 areas by the industry.

INVESTMENTS IN DIGITAL TECHNOLOGIES



Source: Accenture, The 2016 Upstream Oil and Gas Digital Trends Survey

*The percentages in the bars are the proportion of Oil and Gas companies surveyed.

Quick Takeaways & Highlights

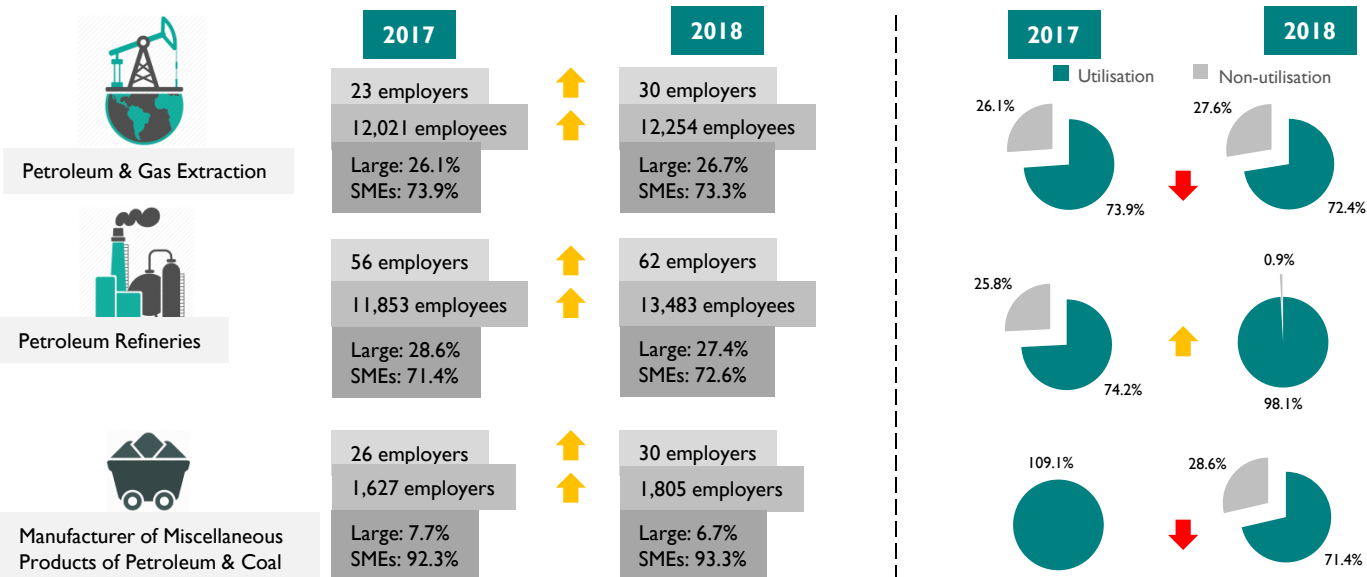
Malaysia is the 3rd largest consumer of energy in Southeast Asia. Petroleum, natural gas and coal are the main fuel sources consumed. (Source: Economic Country Analysis Brief: Malaysia, U.S Energy Information Administration, 2017)

Currently, Malaysia produces approximately 73.8 billion cubic metres of natural gas per day and 705 thousand barrels of crude oil per day. Malaysia also has the world's largest production facility of LNG at a single location, with an annual production capacity up to 29.3 million metric tonnes. (Source: Economic Outlook 2019, Ministry of Finance Malaysia)

SUMMARY & COMPARISON OF SUBSECTORS

Petroleum & Gas Extraction | Petroleum Refineries | Manufacturer of Miscellaneous Products of Petroleum & Coal

COMPARISON IN GROWTH NUMBER OF HRDF REGISTERED EMPLOYERS & HRD FUND UTILISATION



From the comparison of related industries of Oil and Gas, all of the three (3) subsectors have increased in number of HRDF registered employers. Among the subsectors, Petroleum Refineries has the highest number of employers in Large category size which is also the big player in the industries, for e.g. Petronas Gas Berhad and Petronas Refinery and Petrochemical Corporation Sdn. Bhd.

Even though the number of employers and employees covered under HRDF has been increased, the HRD Fund utilisation decreased for Petroleum and Gas Extraction and Manufacturer of Miscellaneous Products of Petroleum & Coal. The drop in utilisation of levy (HRD fund) is due to the decreased number of training activities among the employers. This can be relate to the situation happening in the industry of Oil & Gas, whereby global crude oil price has decreased. Therefore, the Oil & Gas companies have been impacted to a wave of cost reduction. Many cost-cutting initiatives implemented resulted the companies to optimise the operations, improving efficiency and reducing costs in order to sustain profitability.

(Source: Malaysian Investment Development Authority (MIDA))

CHALLENGES AND IMPACTS IN TRAINING

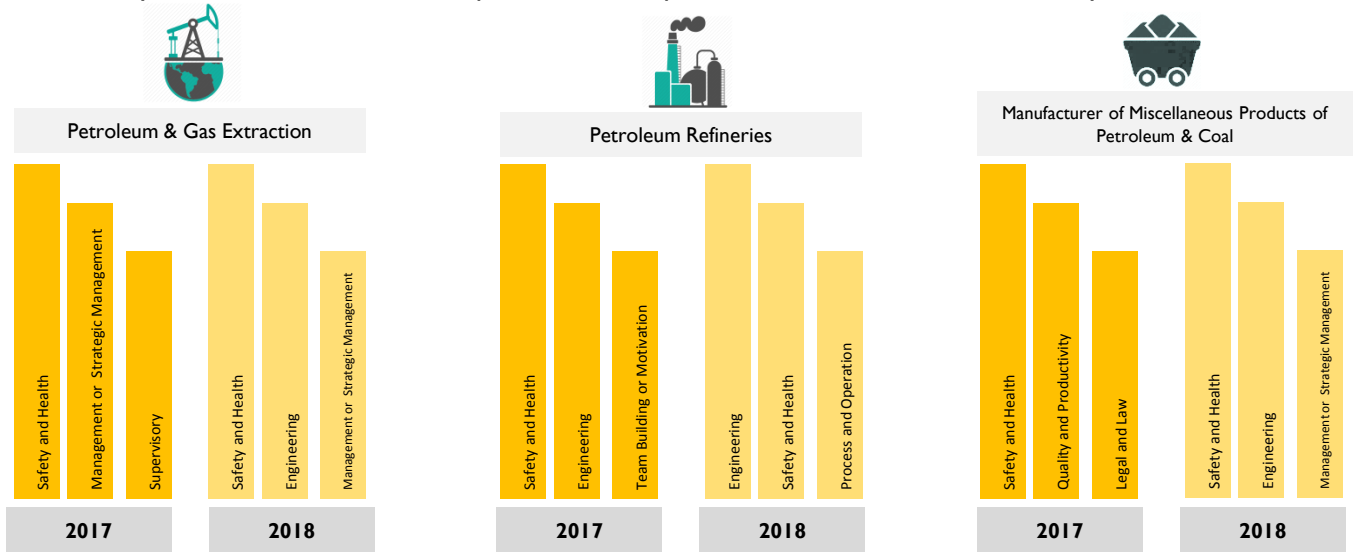


Different industries have different challenges when it comes to training implementation. For Petroleum & Gas Extraction, time is the main constraint due to work operation. The employees have challenges in attending training due to the tight working schedule. The industry should overcome these challenges and aware of the importance of training as the result of incompetent workforce might also impact the companies' productivity and performance.

For Petroleum Refineries, financial constraint is the main issue in conducting training. As the expenses and fees for the technical courses for this industry is quite high, it is also considered as a challenge for the industry with 14%.

OVERALL TRAINING ACTIVITIES IN THE INDUSTRIES

Petroleum & Gas Extraction, Petroleum Refineries and Manufacturer of Miscellaneous Products of Petroleum & Coal industries are all mainly focusing on Safety and Health skills for their workforce. Based on the comparison for Year 2017 and 2018, Safety and Health remain as the top skill areas compared to the other 35 skill areas set by HRDF.



The importance of Safety and Health skill is mainly due to the work nature, its high risk and avoidance of accidents at the workplace. These industries are also set mandatory requirement whereby to enforce the Petroleum (Safety Measures) Act 1984, Occupational Safety and Health Act 1994 and Factories and Machineries Act 1967 to fulfil the job performance.

(Source: Department of Occupational Safety and Health)

TOWARDS INDUSTRIAL REVOLUTION 4.0



The Chemical industry is one of the catalytic industries in the country with rapid growth due to the availability of oil and gas as a feedstock

Subsectors:

- Petroleum products & petrochemicals
- Plastic products
- Rubber products
- Chemical & chemical products
- Oleochemicals

Focus Sectors of Industry 4.0

RMK-11 catalytic and high-potential sectors

Chemical industry including oil and gas is one of the industry identified as a high potential sector in Industrial Revolution 4.0.

(Source: Industry4wrd, Ministry of International Trade and Industry)

For Petroleum & Gas Extraction, Additive Manufacturing is the most important pillar in IR4.0 based on the feedback from HRDF registered employers in the industry. As the industry uses many complex machinery, additive manufacturing allows even faster assembly time, its performance and emission reduction improvement.

Petroleum Refineries found that Cybersecurity is the most important area as it plays an important role in ensuring information systems are being protected from cybercrime threats to its production line management, mining operations control and oil and gas monitoring. In the oil and gas sector, these systems are used to monitor and control operations across the entire value chain. With the increase in number of system breaching, this is the area whereby a safety priority, as operational systems are at risk of being hacked, which might cause a great financial assets loss.

(Source: Ernst & Young Global Limited, 2018)

Overall, in Oil and Gas industry, the Internet of Things (IoT) benefits the operation by improving the reliability, optimising operations and creating new values. For instances, the downstream area for petroleum products refiners and retailers may see the potential opportunities in generating revenues by expanding visibility into the hydrocarbon supply chain and focusing on digital consumers as a target group in new forms of connected marketing.

(Source: Deloitte, 2019)

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Human Resources Development Fund (HRDF)

INDUSTRIAL INSIGHTS' REPORT SNAPSHOT

Issue: 4/2019

HRD LEVY UTILISATION IN 2018

71.4%



Manufacturer of Miscellaneous
Products of Petroleum & Coal

98.1%



Petroleum Refineries

72.4%



Petroleum & Gas Extraction

CHALLENGES IN TRAINING



Time constraint
due to work
operation



Financial constraint
due to high training
costs



No
commitment
from employees

TOWARDS INDUSTRY 4.0



Additive
Manufacturing



Cyber
Security



Internet of
Things (IoT)

CRITICAL SKILLSETS



Process and
Operation



Safety &
Health



Engineering



Maintenance or
System and
Control



Quality &
Productivity

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