



**PETRONAS Twin Towers**  
Kuala Lumpur, Malaysia

**World's tallest twin towers**

## **PETRONAS' Deployment of ISO 15926 (Towards Integrated Operations)**

**SEMANTIC DAYS 2008**

21 – 23 April 2008, Stavanger, Norway



**Wan Hassan Wan Mamat**  
GM/Custodian, I & C Engineering  
PETRONAS Carigali Sdn Bhd, Malaysia

**Introduction to PETRONAS**



**PETRONAS PCIM Initiatives**



**PCIM AND ISO15926 Deployment**



**Integrated Engineering Tools**



**Integrated Operations Initiatives**



**Current Activities**



**Conclusion**



# Introduction



Petroleum Nasional Berhad  
(PETRONAS)  
Holding company



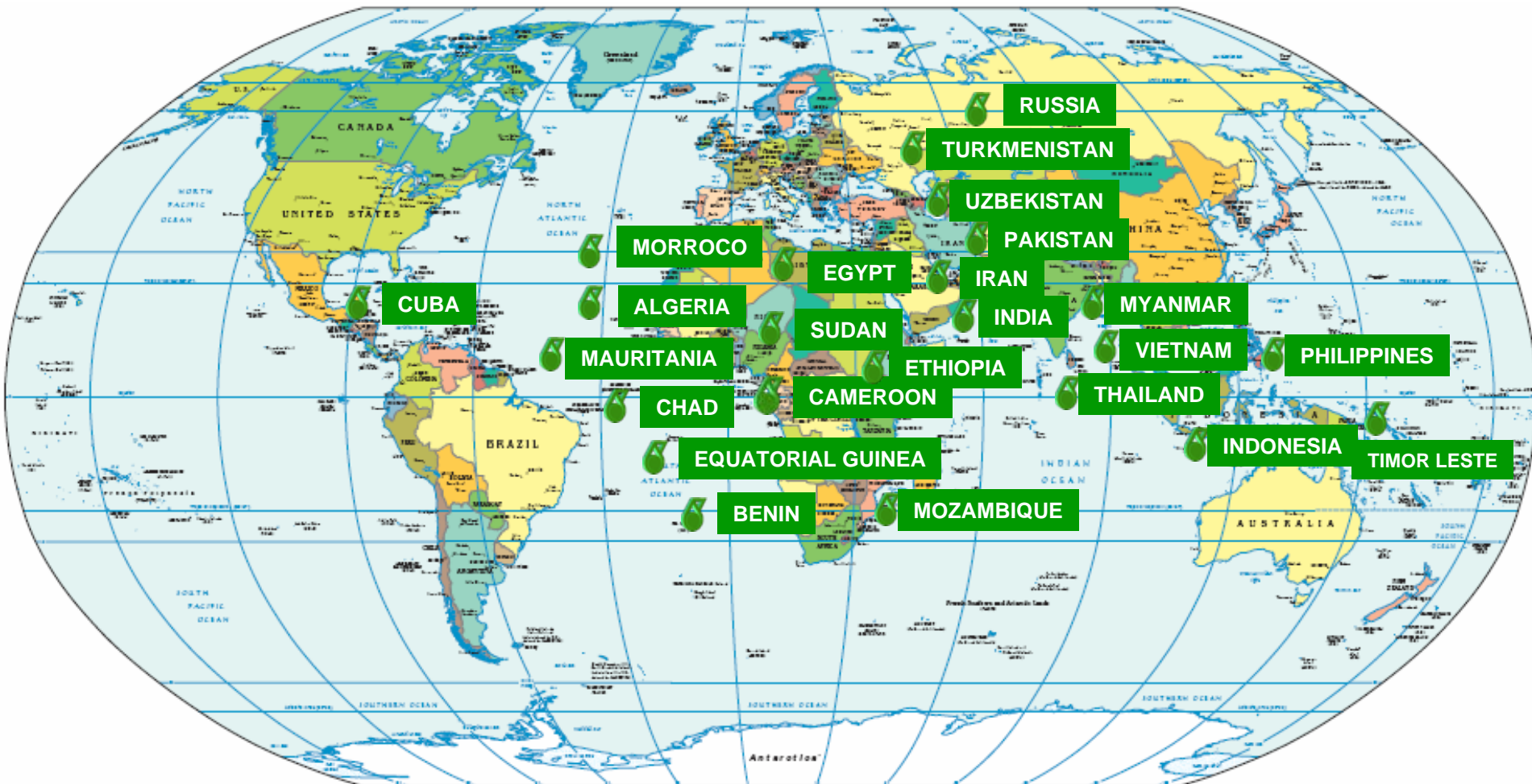
PETRONAS CARIGALI SDN BHD (PCSB)  
Wholly-owned subsidiary of PETRONAS  
(Nature of business: Oil and Gas Exploration & Production)



# Introduction - PETRONAS BUSINESS



# PETRONAS – A Global Player



**Our expanding multinational workforce drives PETRONAS' operations in both Upstream and Downstream Businesses in more than 30 countries\***

**(Note: Above map indicates only the countries where our global E & P Business are located)**

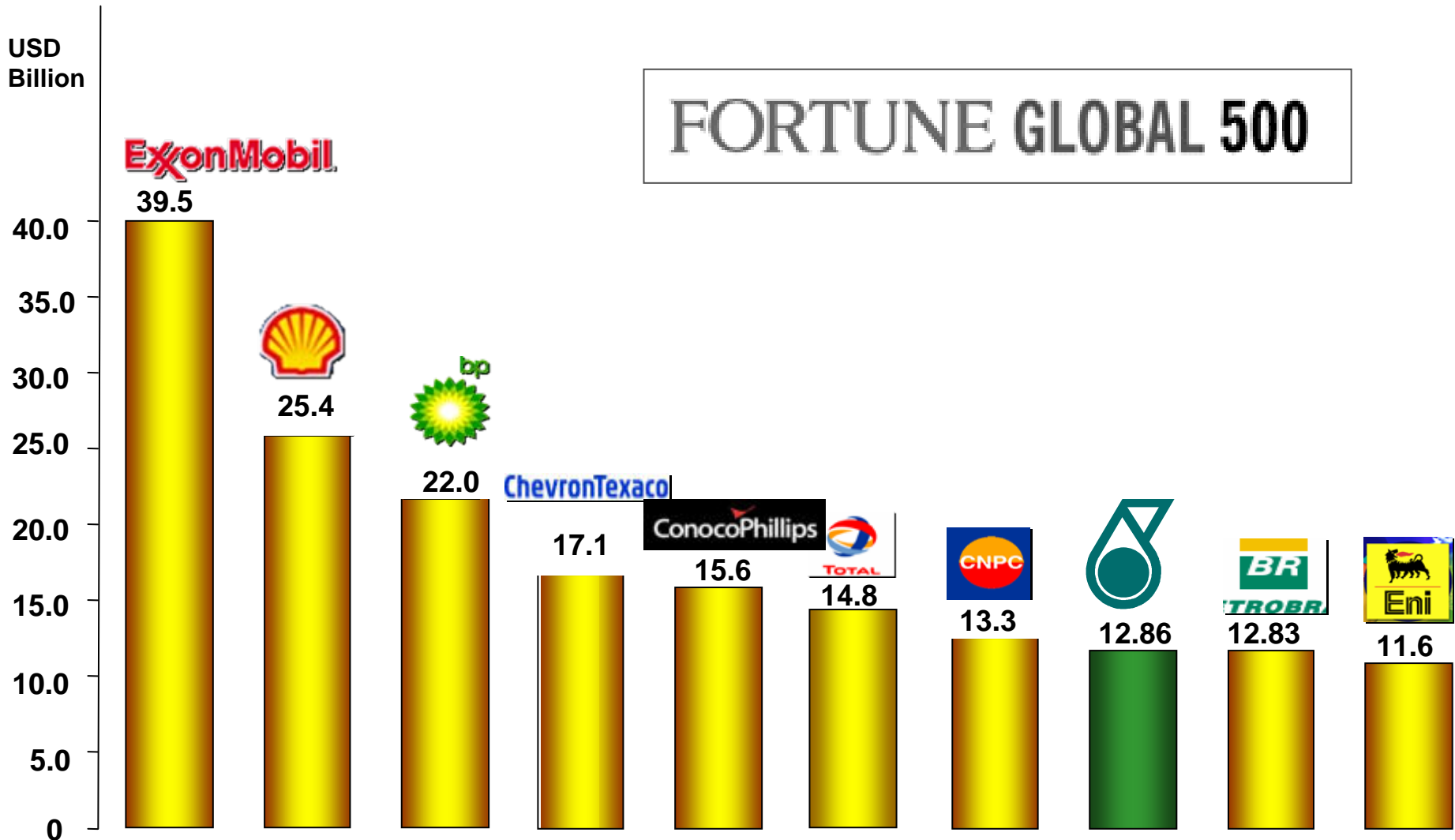
\*as of Dec 2007

**INDUSTRY RANKING: PETROLEUM REFINING**

Ranking by profits		Profits (US\$ million)	
2006	2007	2007	2006
1	1. ExxonMobil	39,500	36,130
2	2. Royal Dutch Shell	25,442	25,311
3	3. BP	22,000	22,341
5	4. Chevron	17,138	14,099
6	5. ConocoPhillips	15,550	13,529
4	6. Total	14,765	15,250
7	7. China National Petroleum	13,265	12,950
<b>8</b>	<b>8. PETRONAS</b>	<b>12,863</b>	<b>11,565</b>
10	9. Petrobras	12,826	10,344
9	10. ENI	11,564	10,920
Returns on revenues		%	
2006	2007	2007	2006
<b>1</b>	<b>1. PETRONAS</b>	<b>25</b>	<b>26</b>
3	2. Petrobras	18	18
2	3. Rosneft	16	24
5	4. Lukoil	14	14
4	5. China National Petroleum	12	15
-	<i>Industry Median</i>	7	7

# Industry Ranking 2007 – Petroleum Refining

## World's Top 10 Most Profitable Petroleum Companies



Source: Fortune Global 500 (23 July 2007)

# ISO 15926 Deployment



**Why PETRONAS is supporting the development and deployment of ISO 15926 ?**



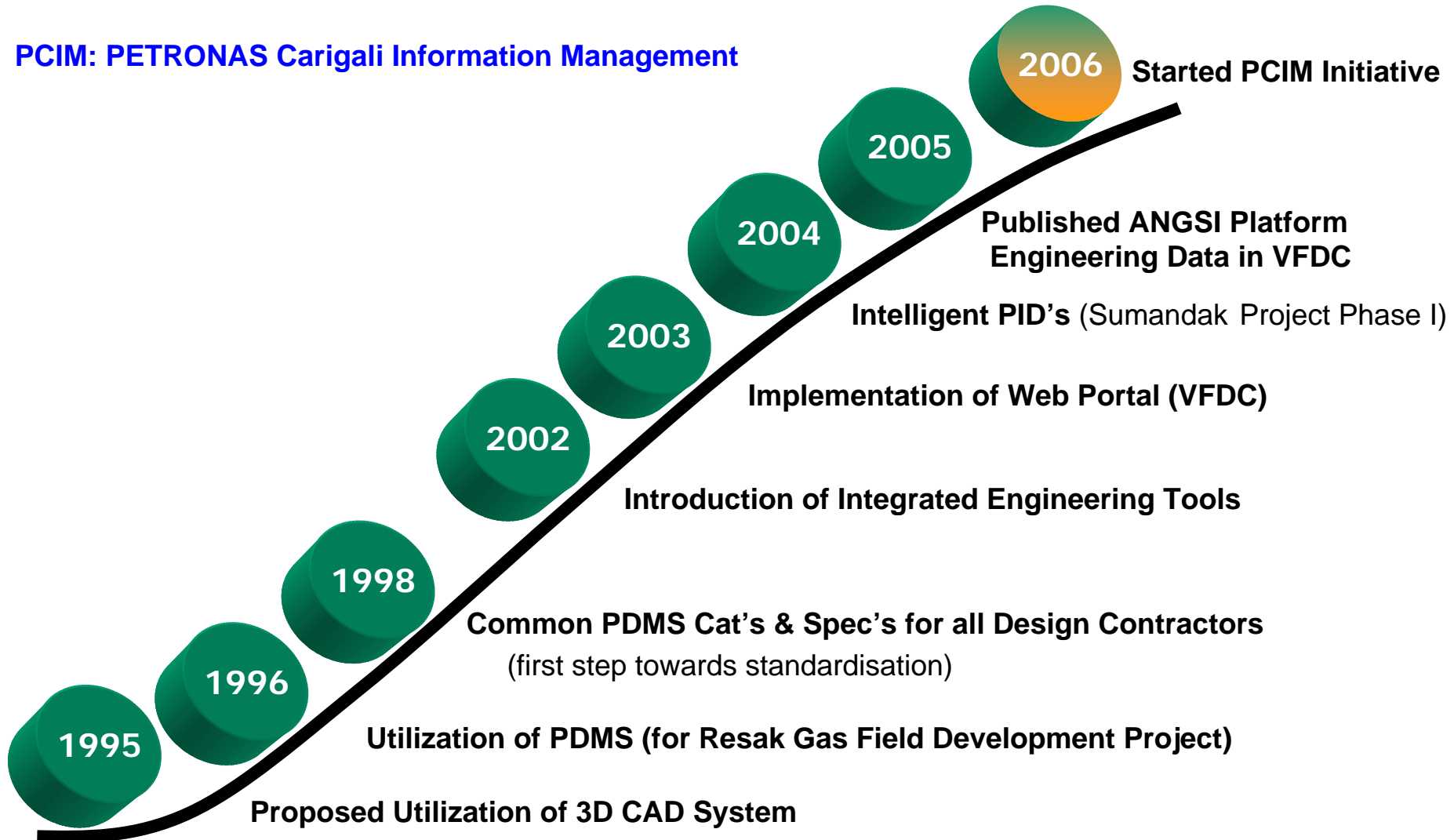


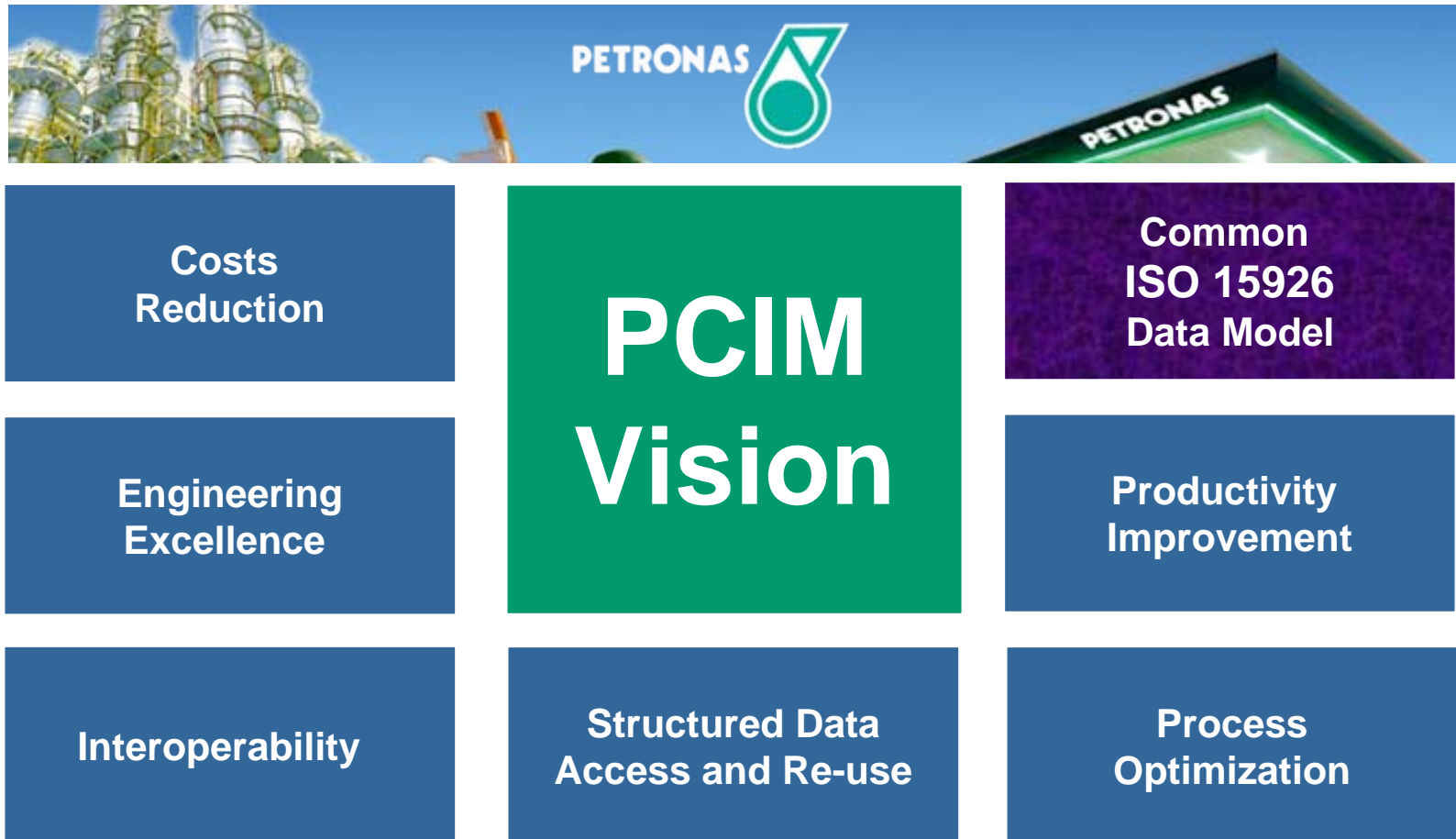
# Integrated Engineering and PCIM Initiative

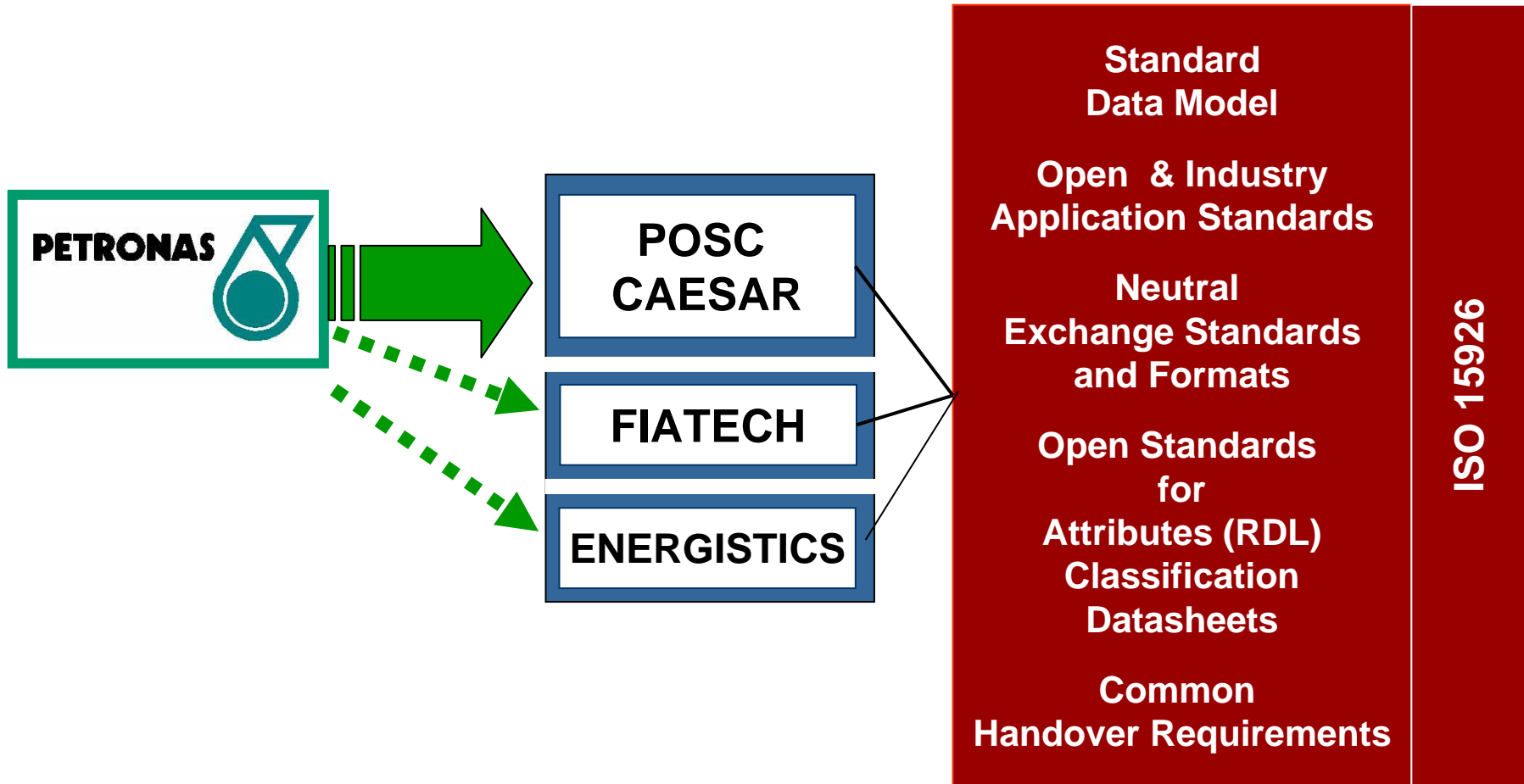
## - The history



### PCIM: PETRONAS Carigali Information Management

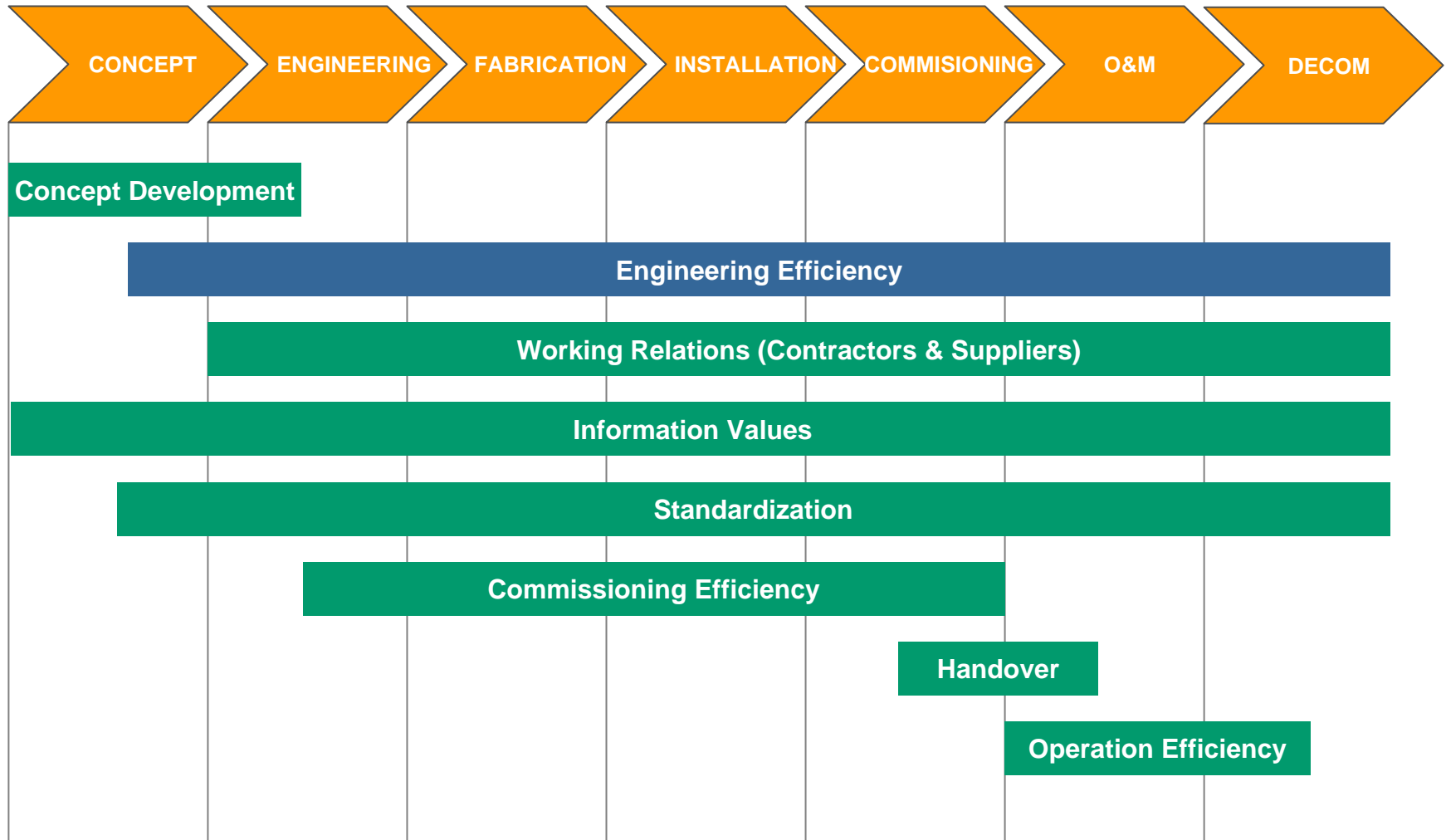






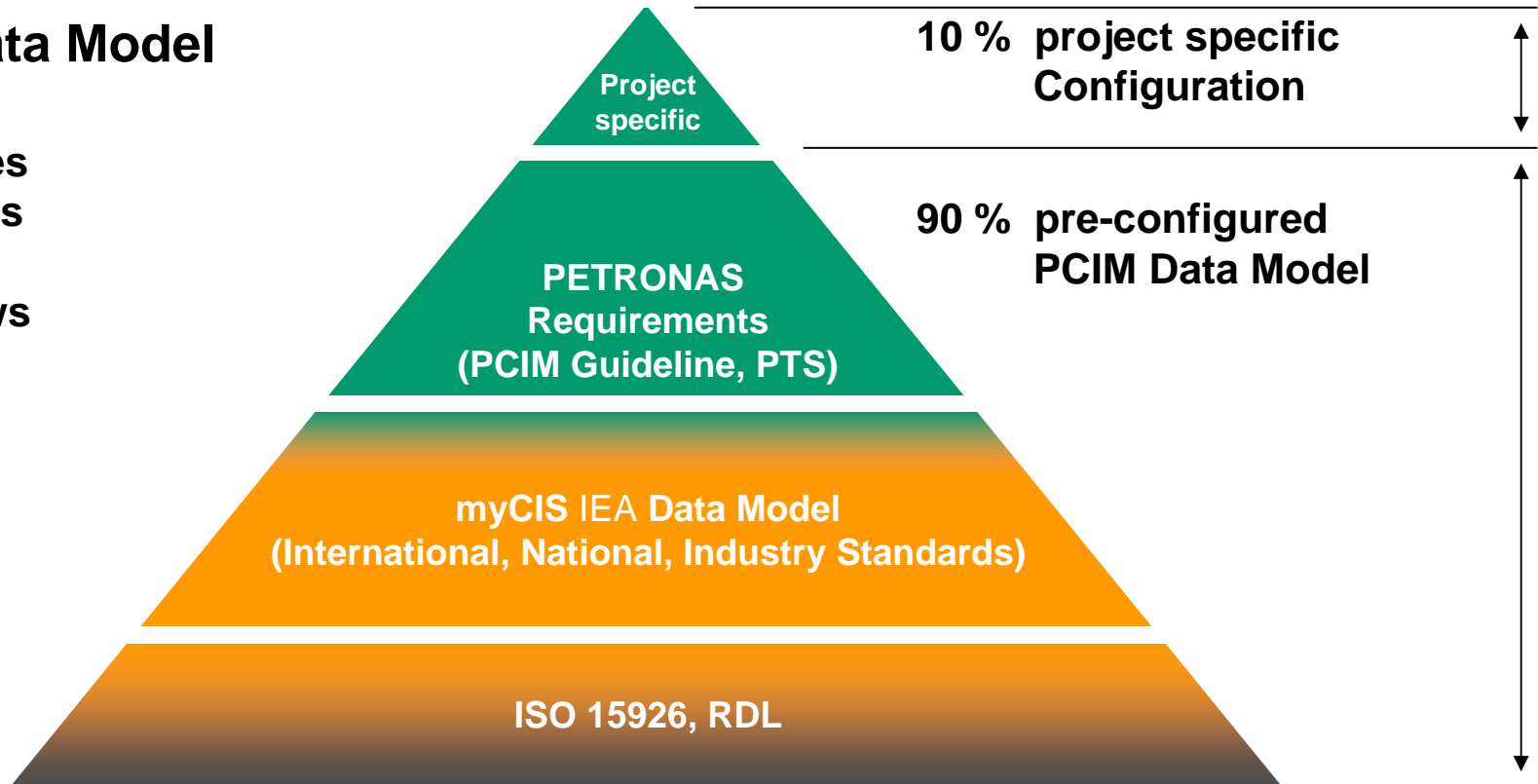
**PETRONAS supports POSC CAESAR, FIATECH and ENERGISTICS  
ISO 15926 and Industry Standard Data Model Vision**

# PCIM Initiative Opportunities – the PCIM impact on the Life Cycle of our Facilities



## PCIM Data Model

- Structures
- Standards
- Content
- Workflows
- Forms
- Formats



**PCIM Information Model Benefits:  
Neutral, No Customization, Accelerated Implementation**

## PCIM Solution

### PCIM Data Model

(Structure, Content, Workflows, Form, Formats)

### Integrated Engineering Application Platform

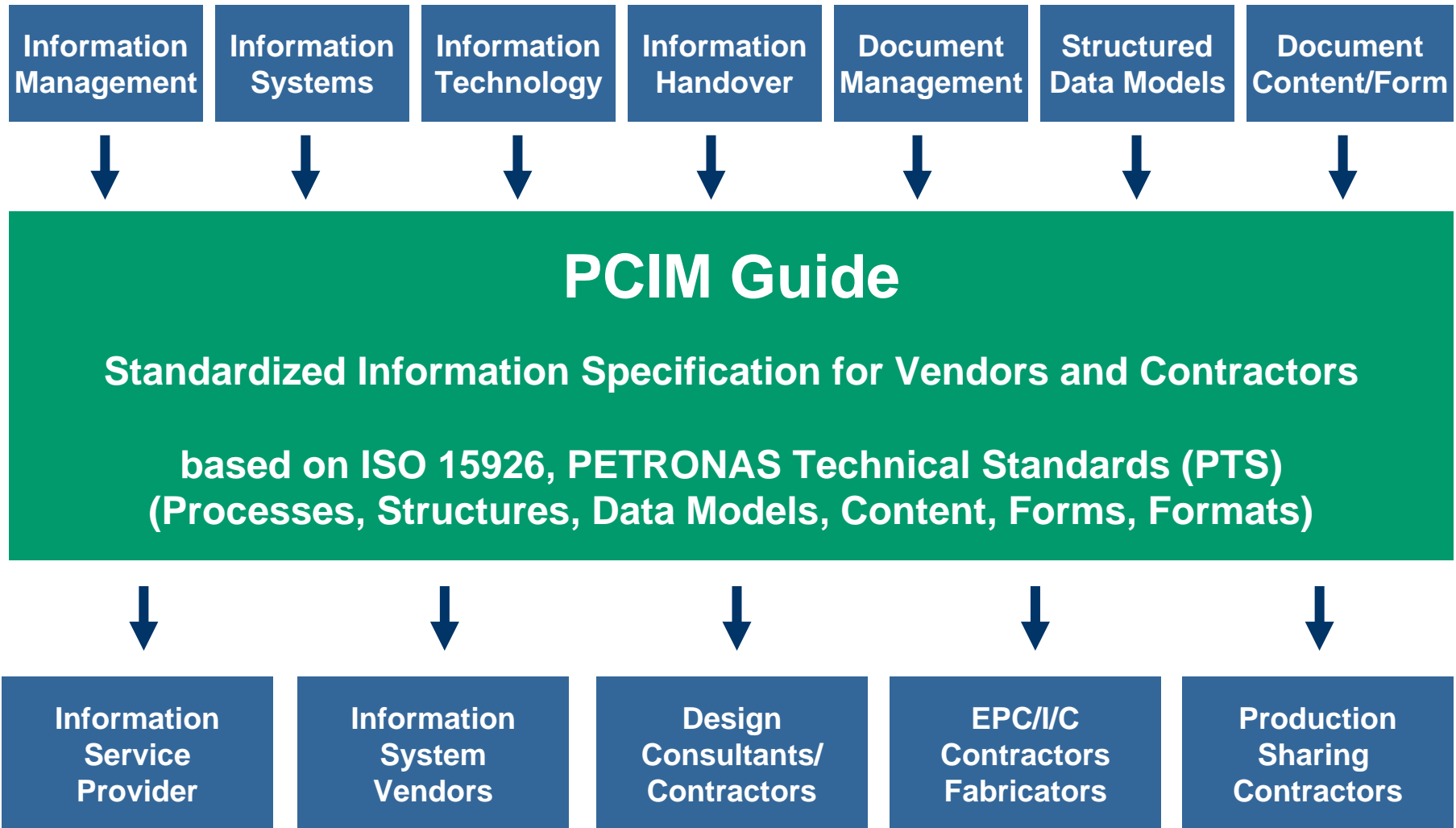
### CAD Application Platform

### Database Layer

### Operation System Layer

### IT Infrastructure

**PCIM Data Model**  
**Mandatory for all Vendors and Contractors!**

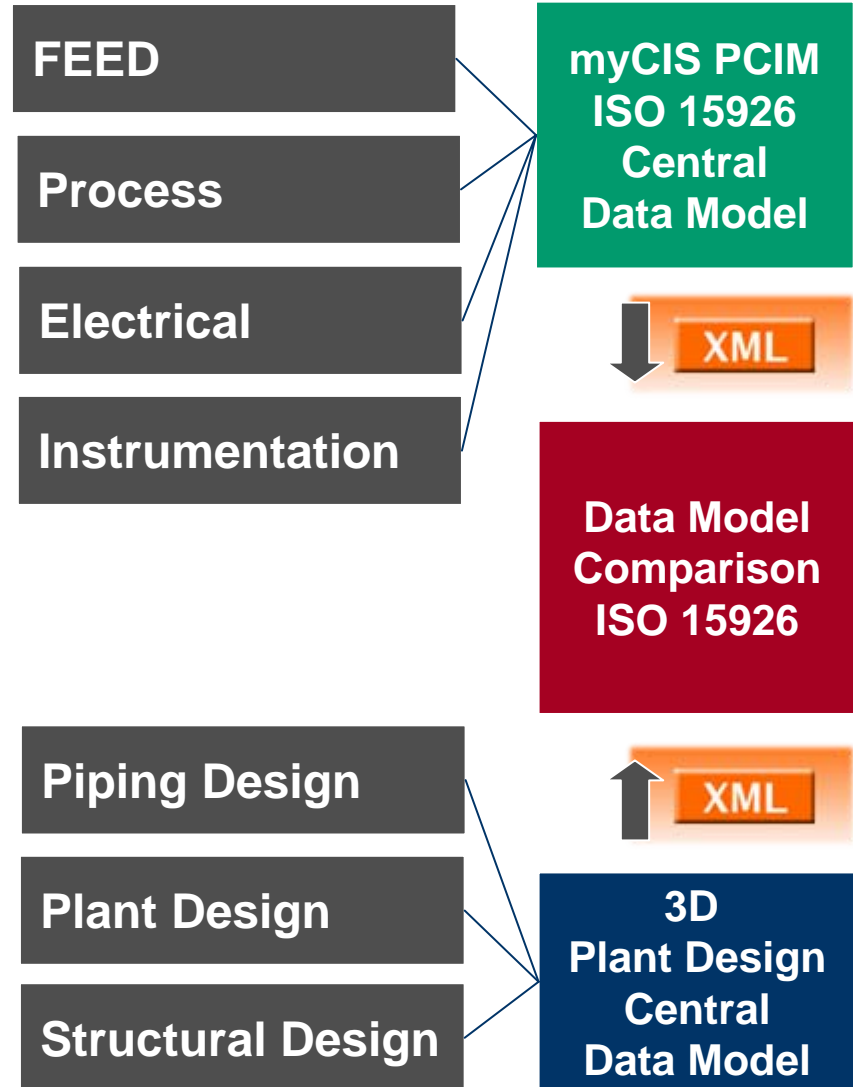


# PCIM Initiative

## Main Objective for Integrated Engineering

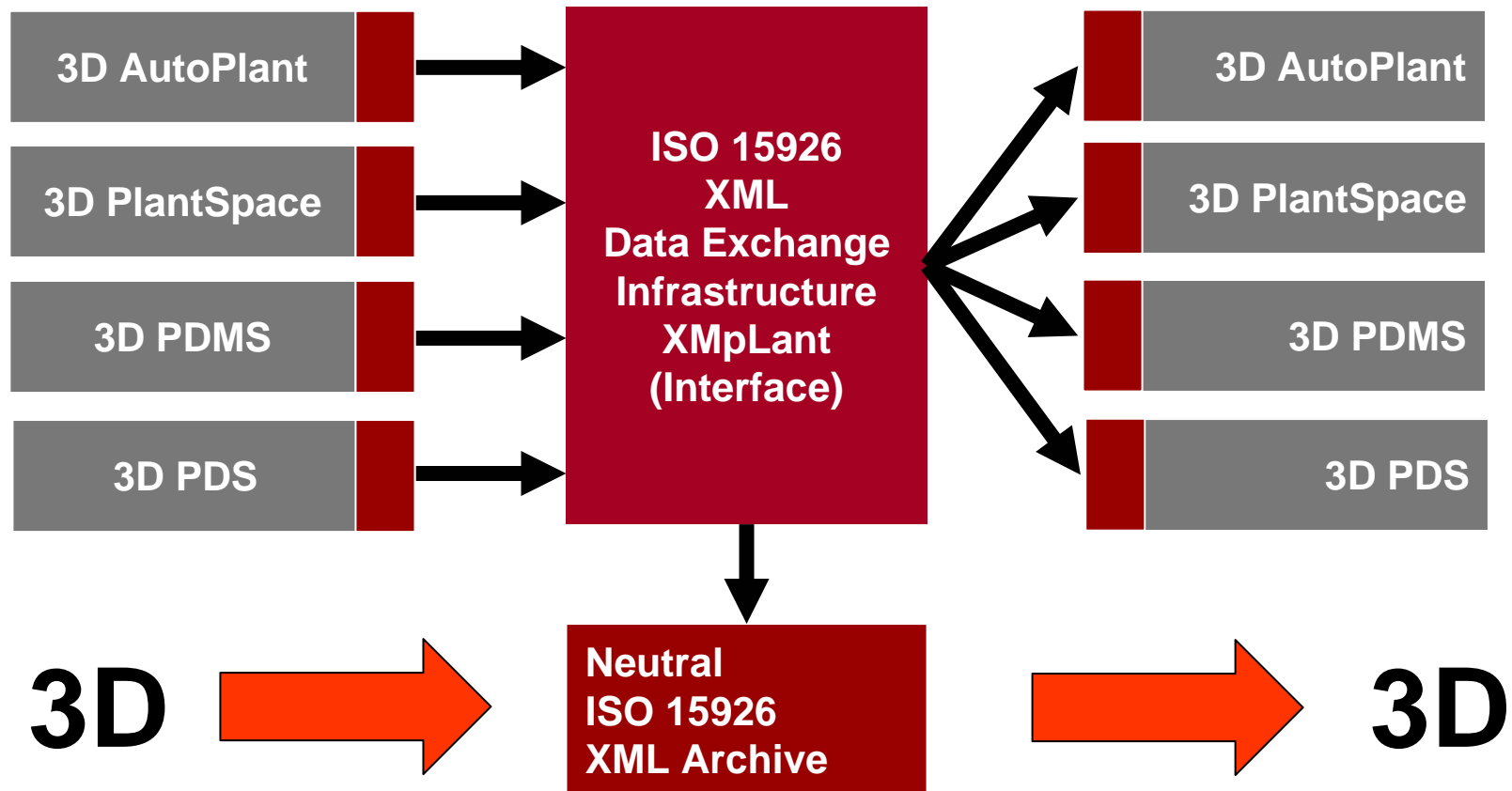


- **2D data centric Engineering**
  - FEED
  - Process
  - Electrical
  - Instrumentation & Control
- **3D data centric Engineering**
  - Plant Design
  - Structural Design, Civil
  - Piping Analysis
- **Integration between 2D – 3D Engineering**
  - XML Data Exchange (ISO 15926)
  - XML Data Model Comparison
- **Document Centric Business Process**

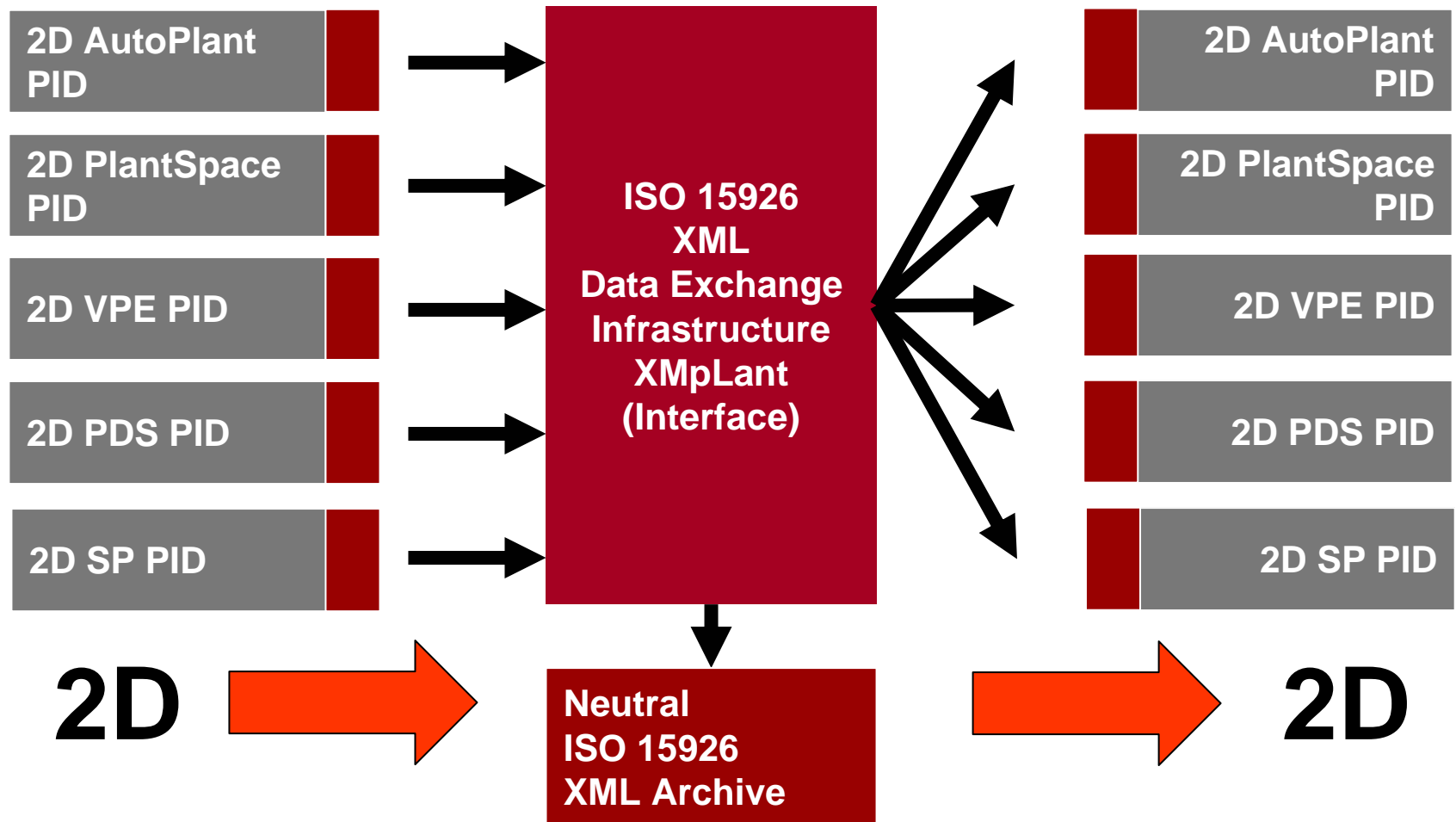


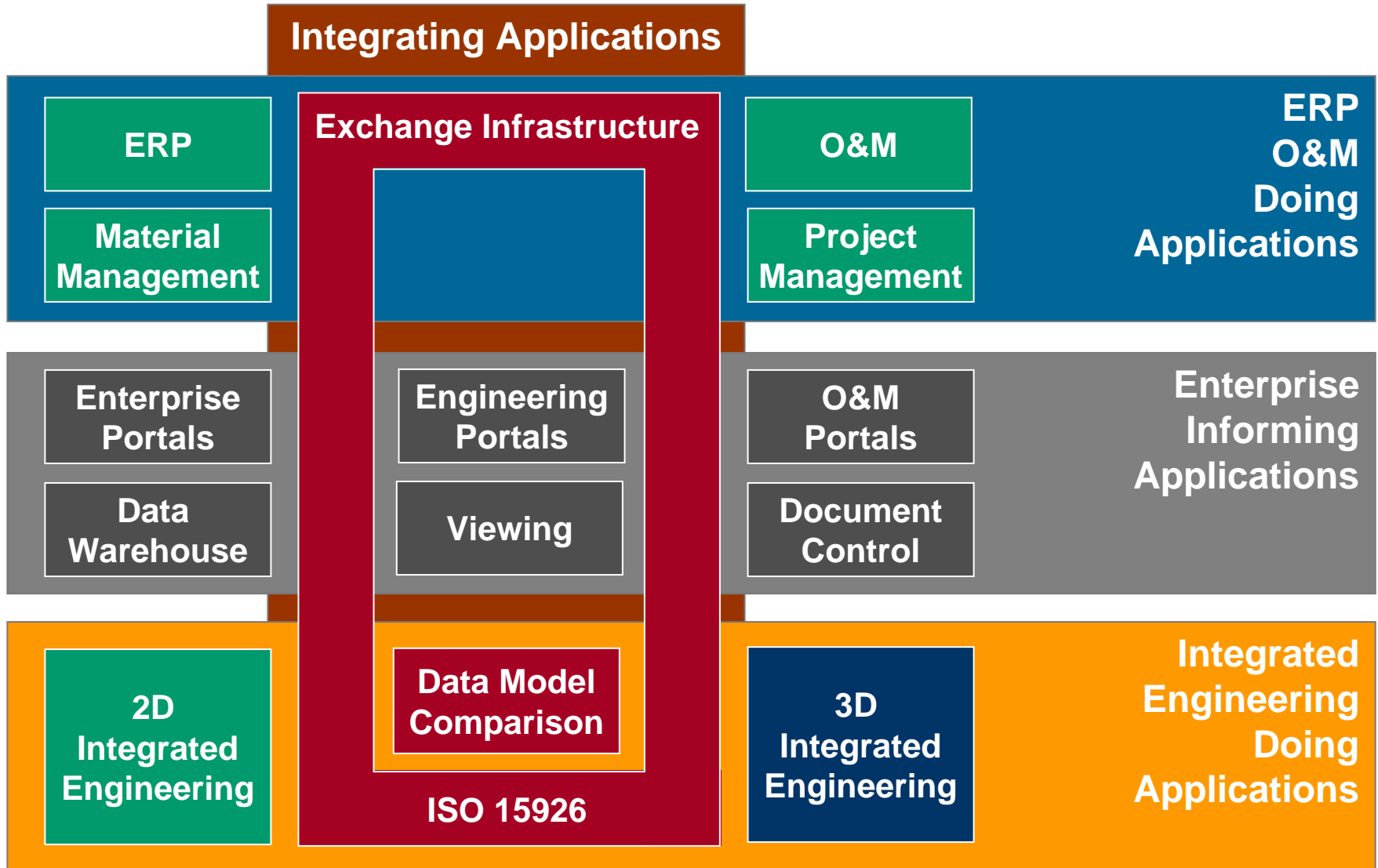


## ISO 15926 3D-Data Model Translation



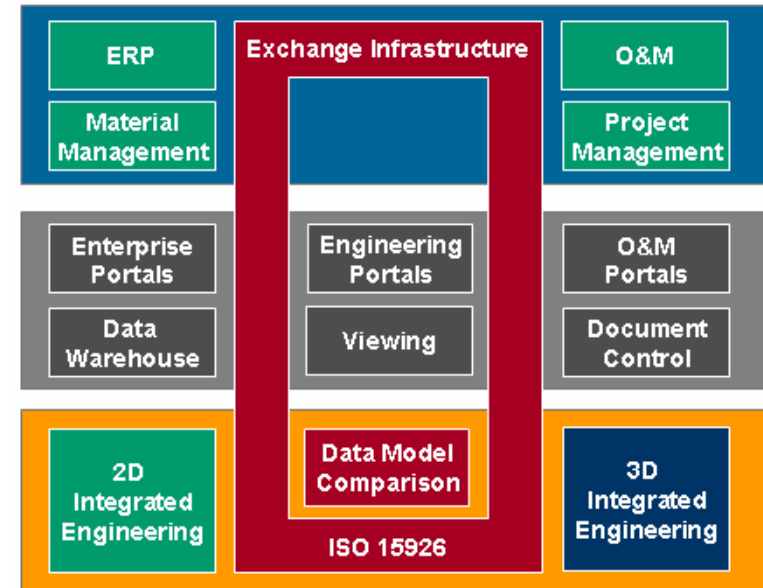
## ISO 15926 2D-Data Model Conversion



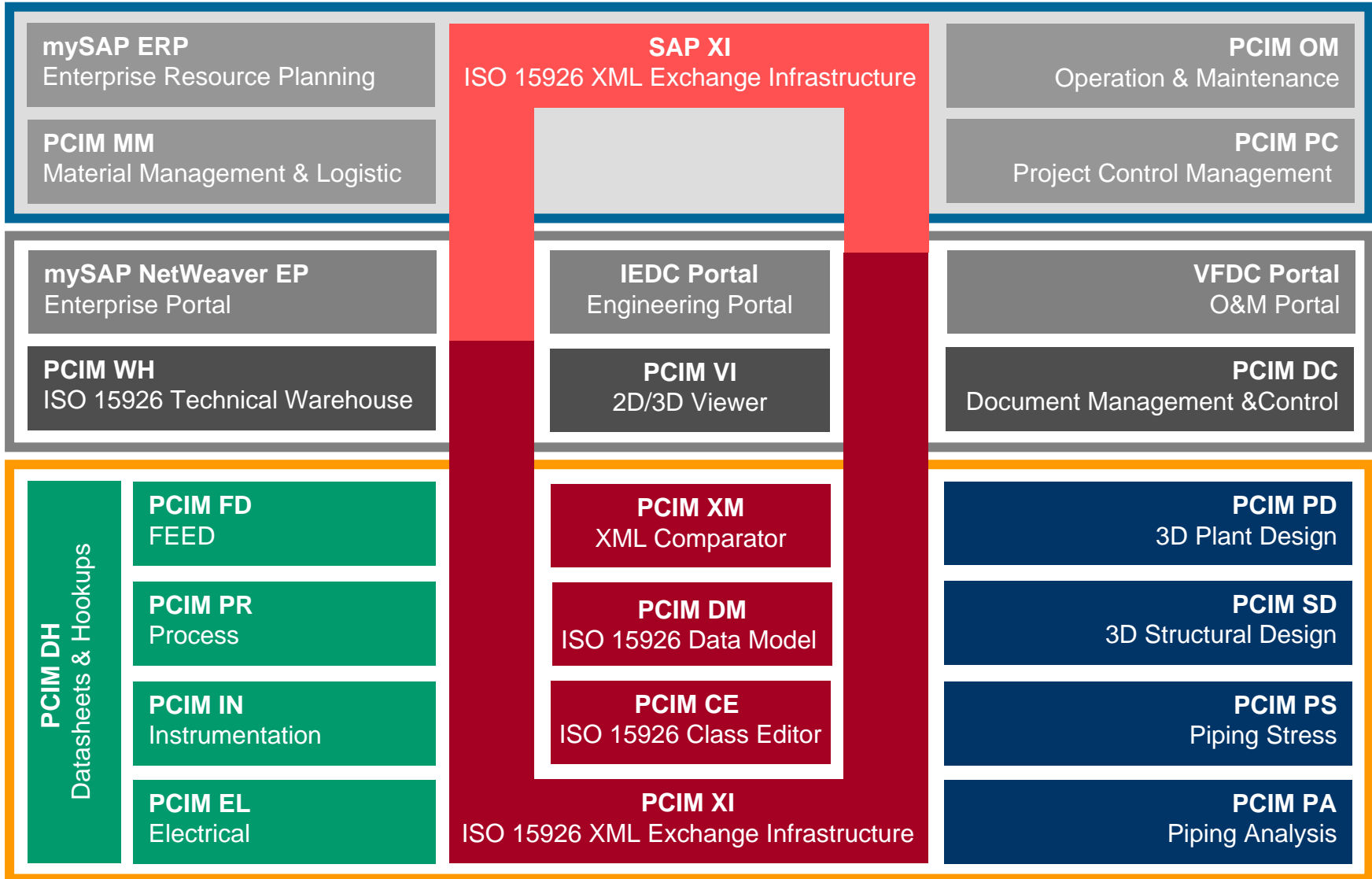


## General Requirements by PCIM on Information Systems

- Software Vendor neutral (no preference)
- Common PCIM Data Model
- Common PCIM Break Down Structures
- Common Exchange Formats (XML)
- Neutral Archive Formats (XML)
- Interoperability between all Information Systems



# PETRONAS (PCSB) Overview - Information System



# PCSB Integrated Operations Initiative (Inspired by F1 Technology)



Our definition:

# SMART

*Self Monitoring And Real Time*

**An oil/gas field capable of self-monitoring and control remotely in real-time to facilitate production operations, production planning and reservoir management**

Photo: Angsi Platform operated by PCSB

# OUR OPERATIONAL VISION.....



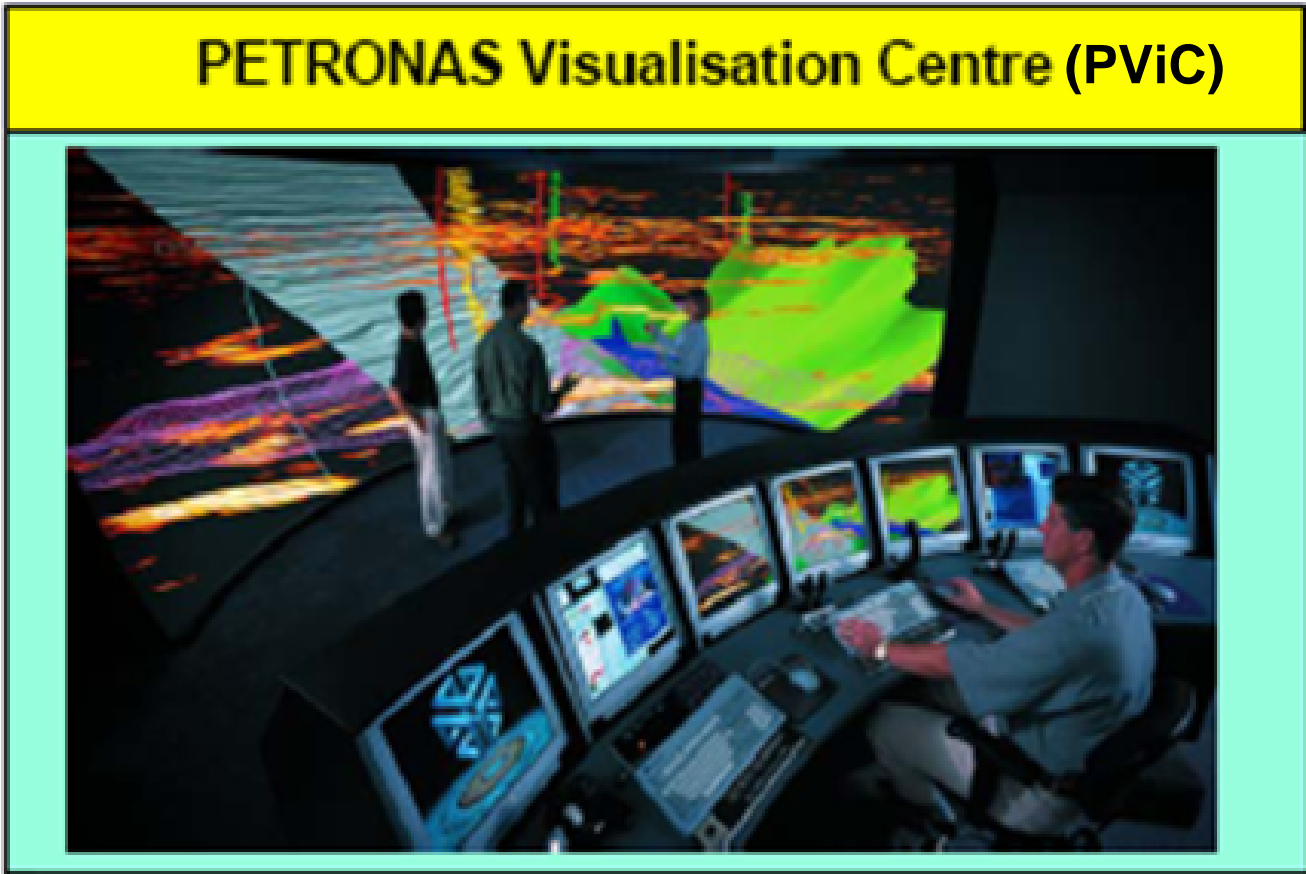
## SMART FIELD OPERATION CENTRE IN PETRONAS TWIN TOWERS





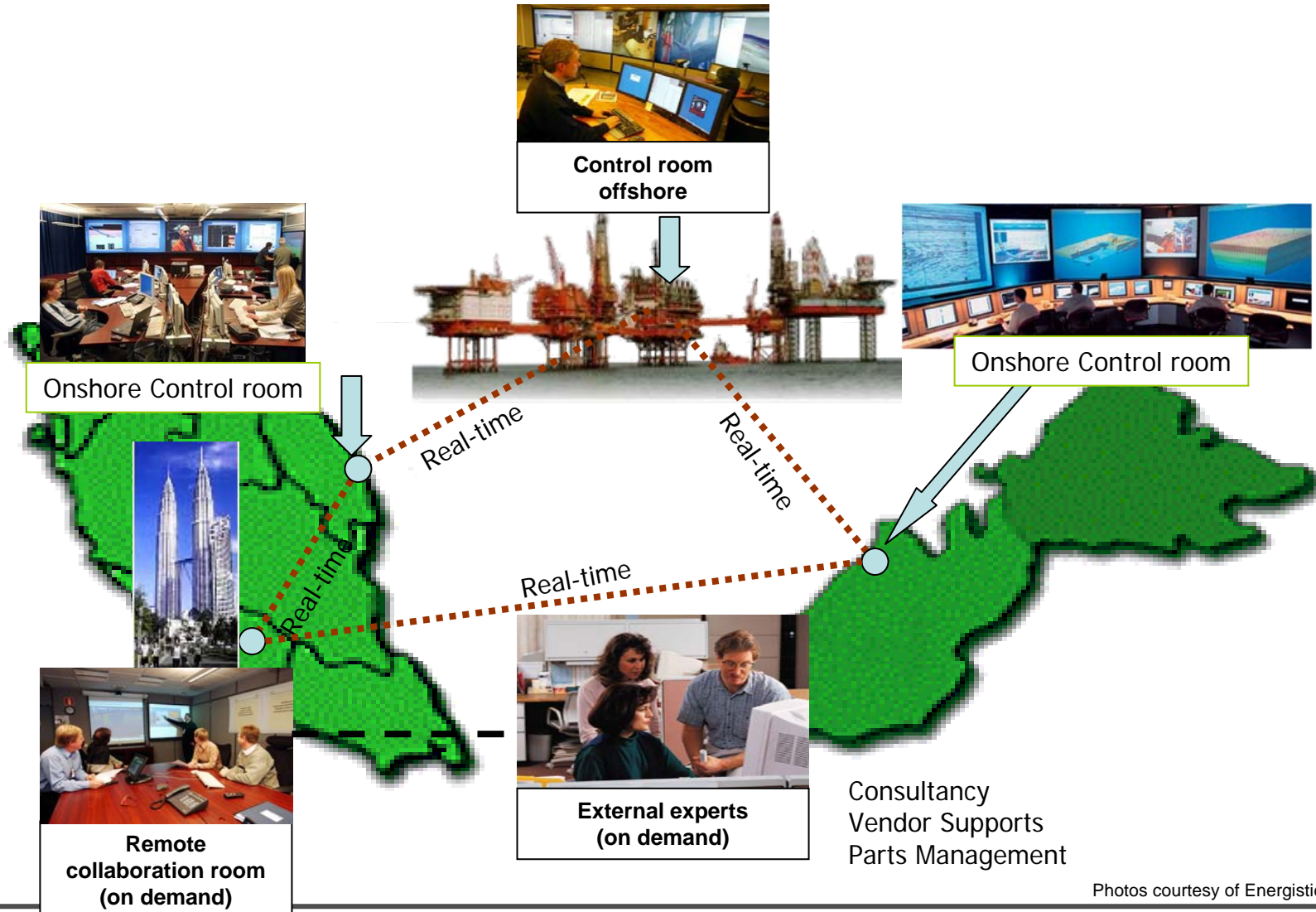
# Our existing facility.....

**PViC - Engineering collaboration centre, where Engineers and Geoscientists discuss and decide**



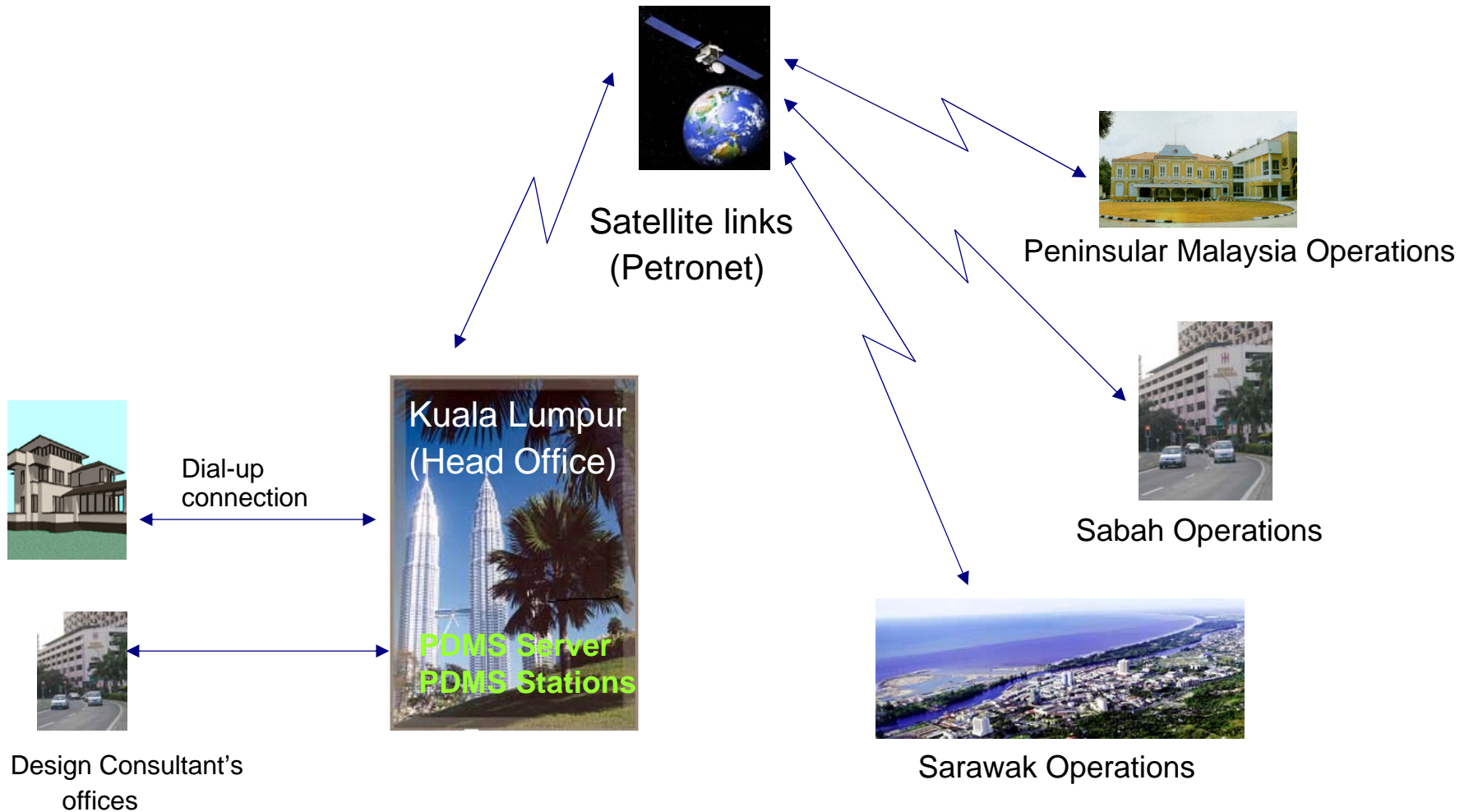
**PETRONAS Visualisation Centre (PViC)**

# Towards SMART Field Operations (PCSB-Domestic Operations)

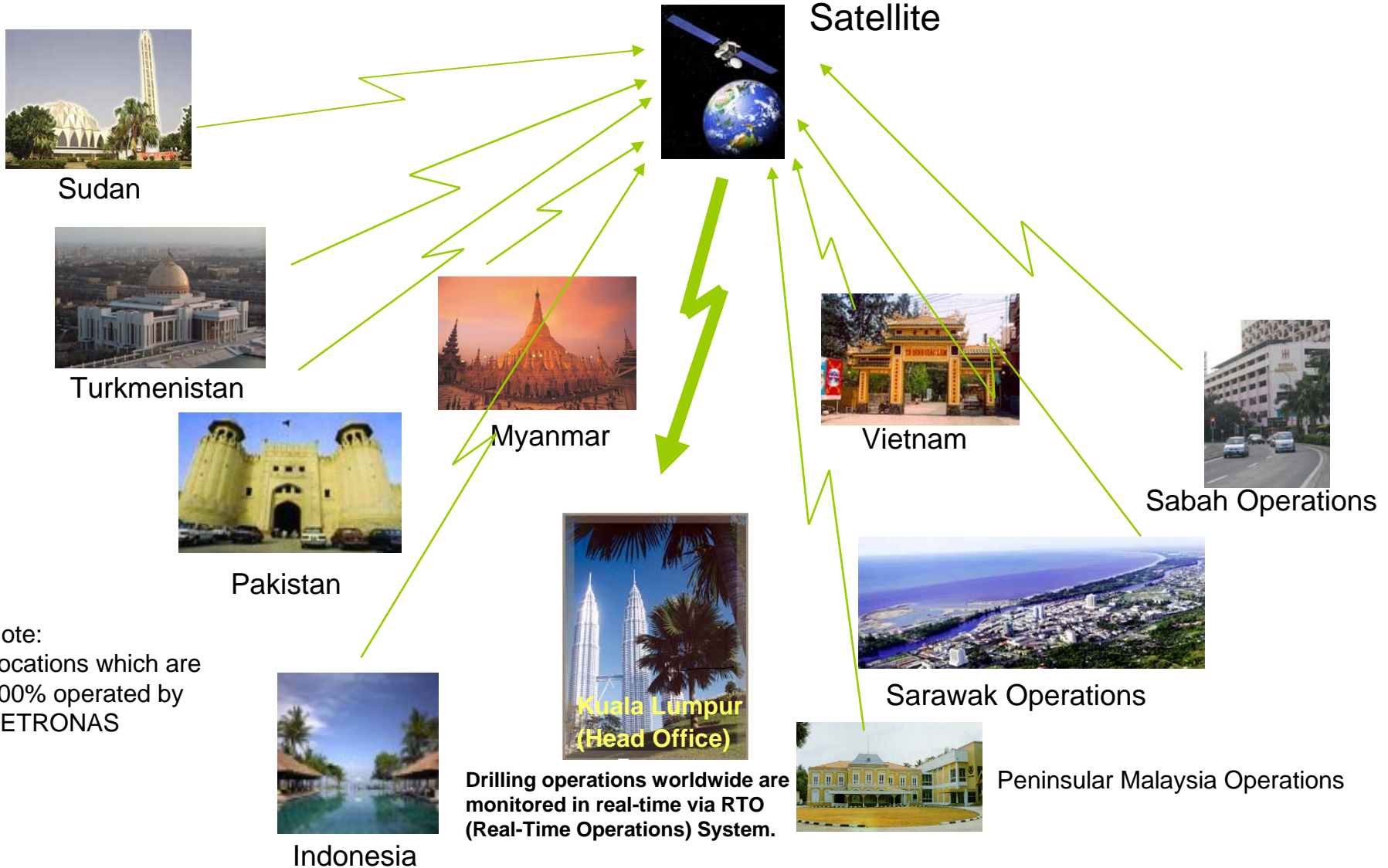


Photos courtesy of Energistics and PETRONAS

# Integrated Engineering & Operations (PCSB- Domestic capital projects and operations)



# Towards Integrated Engineering and Operations (PCSB-International Operations)



Note:  
Locations which are  
100% operated by  
PETRONAS

Drilling operations worldwide are  
monitored in real-time via RTO  
(Real-Time Operations) System.

# PCIM Initiative & ISO 15926

## Ongoing Activities



- **PCIM Datasheet Standards**
  - Harmonizing and Standardizing PETRONAS Carigali Datasheets based on IDS
  - ISO 15926/RDL Attributes and Classification for PCIM Datasheets
- **PCIM Schematics Standards**
  - Harmonizing and Standardizing the form and format for P&ID's based on ISO 15926/XMplant Requirements (Pipe, PipeSegments etc.) to enable 2D-3D Data Model comparison
- **PCIM 3D Standards**
  - Harmonizing and Standardizing the 3D Data Model Structure based on ISO 15926/XMplant Requirements (Pipe, PipeSegments etc.) to enable 3D-2D Data Model comparison
- **PCIM ISO 15926 Classification Standards**
  - Harmonizing and Standardizing the ISO 15926 Classification for Engineering Portal (VFDC) and the Engineering tools
- **PCIM Full-scale Application in Capital Project**
  - Tangga Barat Gas Field Development and Kumang Field Development (ongoing).



## Conclusion

**ISO 15926  
facilitates PETRONAS (PCSB)  
in implementation of  
Integrated Engineering  
towards realising its vision in  
SMART Field Operations**



**Exploring tomorrow's technology to work for us today.**



**Thank You**