

BE Transform, the journey continues



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making the **difference**



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Author/ Speaker Profile



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Author/ Speaker Profile



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- Senior Cost Manager, Turner & Townsend
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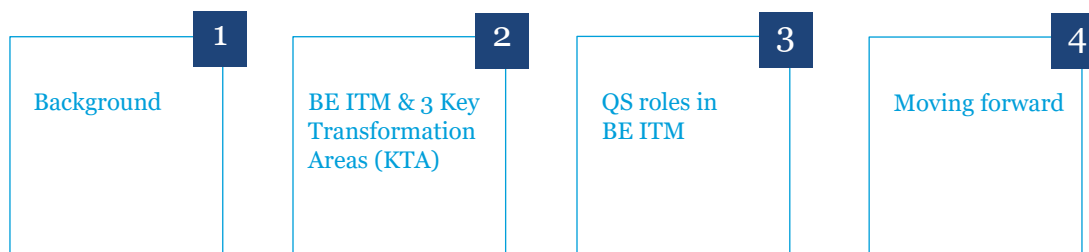
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Built Environment Industry Transformation Map (BE ITM)

Agenda



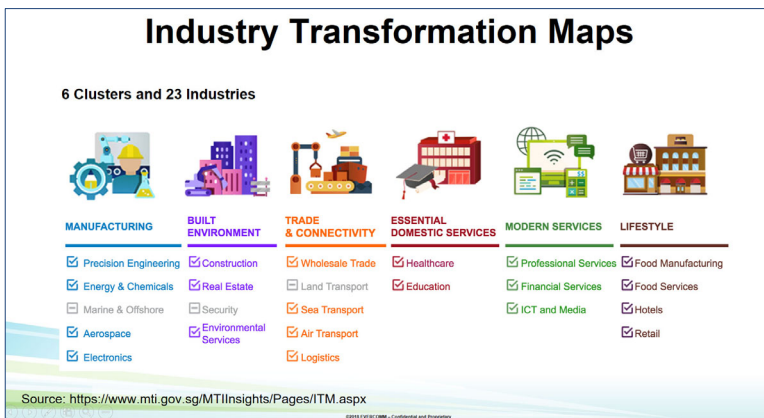
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What are ITMs?

- Supervised and implemented by the Future Economy Council (FEC)
- Under S\$4.5 billion Industry Transformation Programme
- Roadmaps for 23 industries have been developed

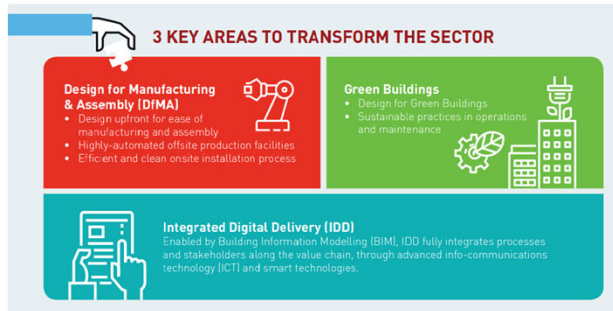


(Source: Ministry of Trade and Industry, Singapore)

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Construction ITM

- Launch at Singapore Construction Production Week 2017
- Vision to transform the BE sector into:
 1. Advanced and integrated sector
 2. Progressive and collaborative firms
 3. Good jobs for Singaporeans
- Focusing on **3 Key Areas** to transform the sector:



(Source: Building and Construction Authority [BCA], Singapore)

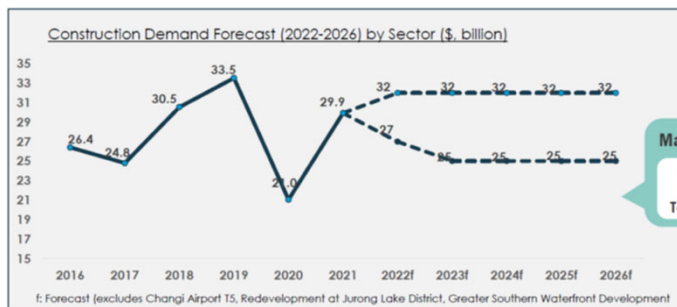
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Why BE ITM?

- What: Amalgamation of the **(1) Construction ITM** and **(2) Real Estate (Facilities Management) ITM**
- Why: Impact of COVID-19 on the Sector
 1. Project delays (e.g. manpower shortage)
 2. Manpower & compliance costs
 3. Cashflow of firms affected (with weaker firms exiting the sector)
- Why: Paving the way for transformation as sector stabilises



Construction demand has gradually recovered since 2021

Many New & Exciting Projects Coming Up!

Changi Airport Terminal 5

Jurong Lake District

Greater Southern Waterfront

(Source: BCA, Singapore)

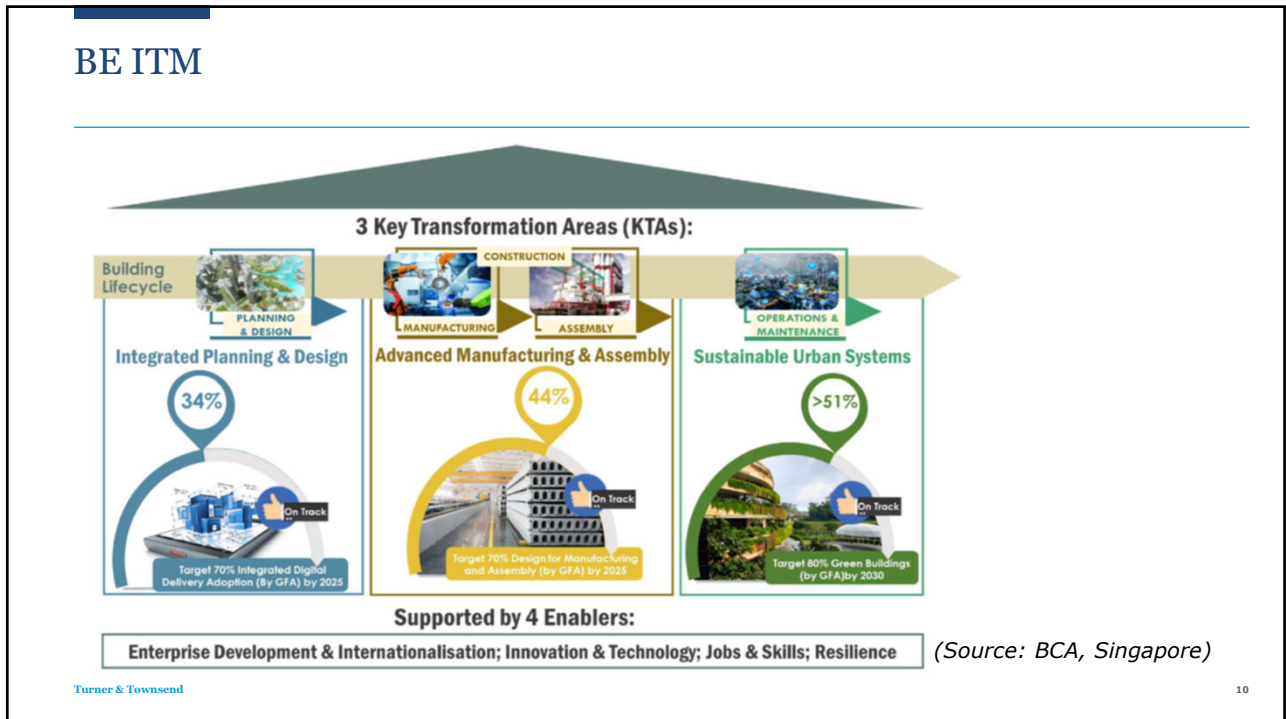
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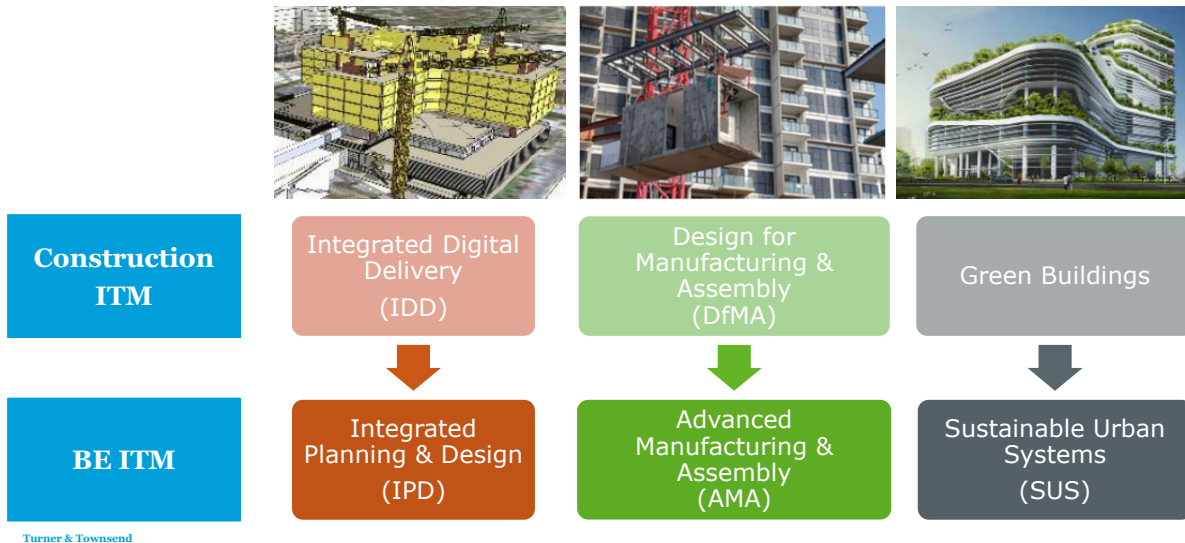


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From Construction ITM to BE ITM



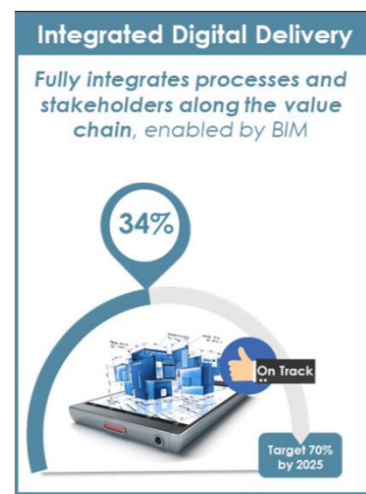
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Key Transformation Area 1: Integrated Planning & Design (IPD)

- **Achievement since launch:** **34% of IDD adoption rate** by Gross Floor Area (GFA) for new developments
- **BE ITM Target:** **70% by 2025**
- **What are we lacking:** Abortive work and lack of collaboration. Full potential of BIM/ IDD not realized
- **Where are we headed:** Optimised design for entire building / district lifecycle (including FM), enabled by digitalization, collaboration and progressive procurement

Key action plan

1. Digital platforms: [CORENET X](#), [Common Data Environment \(CDE\)](#)
2. Collaborative contracting:
 - [7 Government Procuring Agencies](#) have identified **9 upcoming projects** to pilot collaborative contracting
 - Contract Management consultants such as **Turner & Townsend, WT Partnership, AECOM and Threesixty** are also supporting this effort by providing advisory services to [private sector clients](#)



(Source: BCA, Singapore)

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EXAMPLE OF IPD (KTA NO. 1) Woodlands North Coast



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(Source: JTC, Singapore)

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EXAMPLE OF IPD (KTA NO. 1) Woodlands North Coast – 1 & 7 North Coast



- **BCA Awards 2022 – BE Transformation Award, Industrial Category**
- Singapore's new-generation **work-live-play-learn** mixed-use industrial estate comprising offices, business park, industrial facilities and residences
- **1 North Coast:** 9-storey light industrial building
- **7 North Coast:** 8-storey general manufacturing industrial building
- Extensive use of digitalisation: **IDD & CDE**
- New BIM processes integrating 3D model & CostX for **automated generation of progress payments**
- Implementation of 5D Progress Claim: Improvement of **34%** in resource management
- **Design for Maintainability:** Identified potential maintenance issues at the design phase
- **Strong partnership across the entire value-chain:**
 - Main contractor co-developed solutions with their value-chain
 - E.g. Bar bending schedule generated directly from BIM & sent for fabrication: increased **30%** productivity

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Key Transformation Area 2: Advanced Manufacturing & Assembly (AMA)

- **Achievement since launch:** **44% of DfMA adoption rate** by GFA
- **BE ITM Target:** **70% by 2025**
- **What are we lacking:** Manual construction method off-site despite DfMA drive
- **Where are we headed:** Automated fabrication in factory-like settings (better environment/ jobs, more productive)

Key action plan

1. Making DfMA the default mode of construction to improve productivity & reduce manual labour
2. Build robust supply chain to optimize land use & reduce impact of disruptions
 - **Integrated Construction Park (ICP)**



(Source: BCA, Singapore)

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EXAMPLE OF AMA (KTA NO. 2) Jurong Port Integrated Construction Park



(Source: SISV, Singapore)



(Source: Jurong Port, Singapore)

- Improved version of the **Integrated Construction and Prefabrication Hubs (ICPH)**
- 5 nos of ICPH (CKR, Straits Construction, Soilbuild, Teambuild, HL-Sunway JV)
- Optimised business processes across supply chain
- Enclosed conveyance system to transport construction materials → **Saved 600,000 truck trips & reduced carbon emission by approx 30,000 tonnes /year**
- **Solar Photovoltaic Panels** capable of generating **3 to 4 megawatt peak of power**

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Key Transformation Area 3: Sustainable Urban Systems (SUS)

- **What are we lacking:** Net zero aspiration and ageing infrastructure
- **Where are we headed:** Low emissions buildings/ districts Better building management enabled by Integrated Aggregated Smart FM

Key action plan

1. Comprehensive decarbonization plans under **Singapore Green Building Masterplan (4th Edition)**
2. Drive Integrated, Aggregated and Smart **FM**



(Source: BCA, Singapore)

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EXAMPLE OF SUS (KTA NO. 3) Singapore Green Building Masterplan (4th Edition)

1 st SGBMP KEY OUTCOME	2 nd SGBMP KEY OUTCOME	3 rd SGBMP KEY OUTCOME
80% of Singapore's buildings to be green by GFA by 2030	80% of new developments by GFA to be Super Low Energy (SLE) buildings from 2030	80% improvement in energy efficiency over 2005 levels for best-in-class green buildings by 2030
CURRENT PROGRESS AS OF MARCH 2022		
More than 49% of Singapore's buildings by GFA have been greened	Close to 7% of new developments by GFA were certified as SLE buildings From 1 April to 30 September 2021, a total of 54 SLE projects involving 98 Built environment firms, including developers, architects, Mechanical/Electrical (ME) and Environmental Sustainable Design (ESD) consultants	Best-in-class buildings achieved 70% improvement in energy efficiency compared to 2005 levels

(Source: BCA, Singapore)

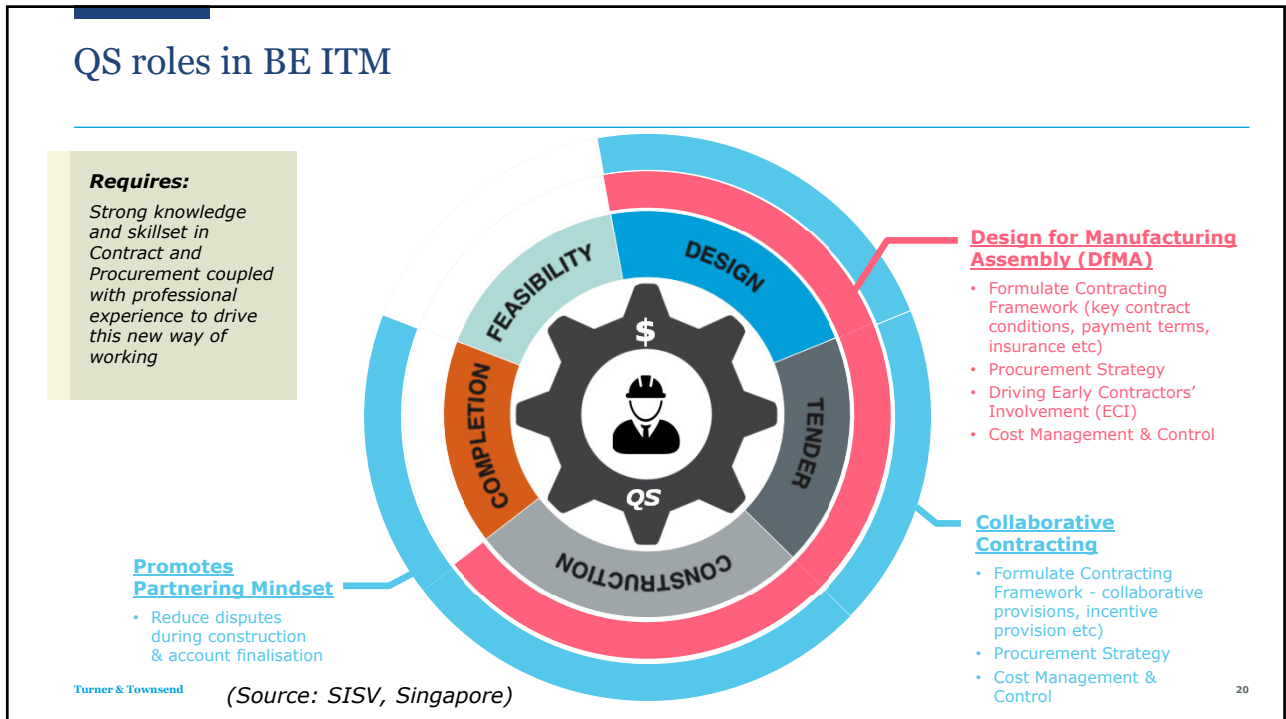
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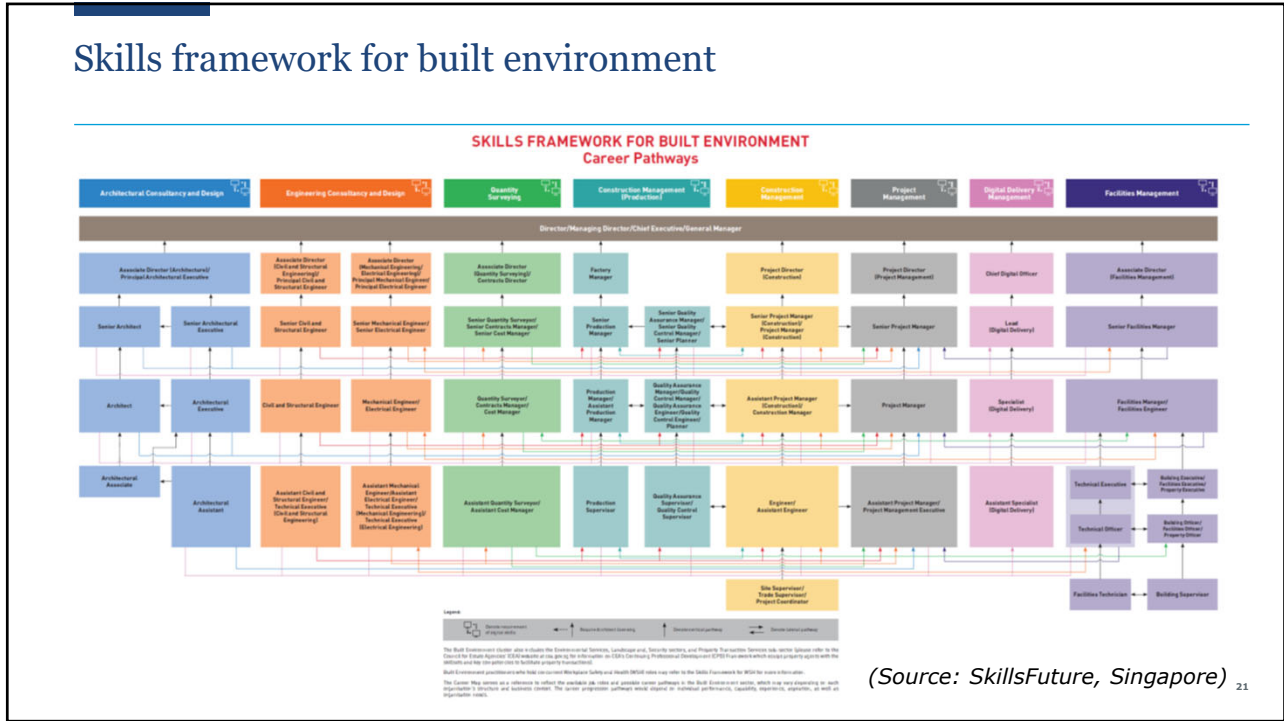


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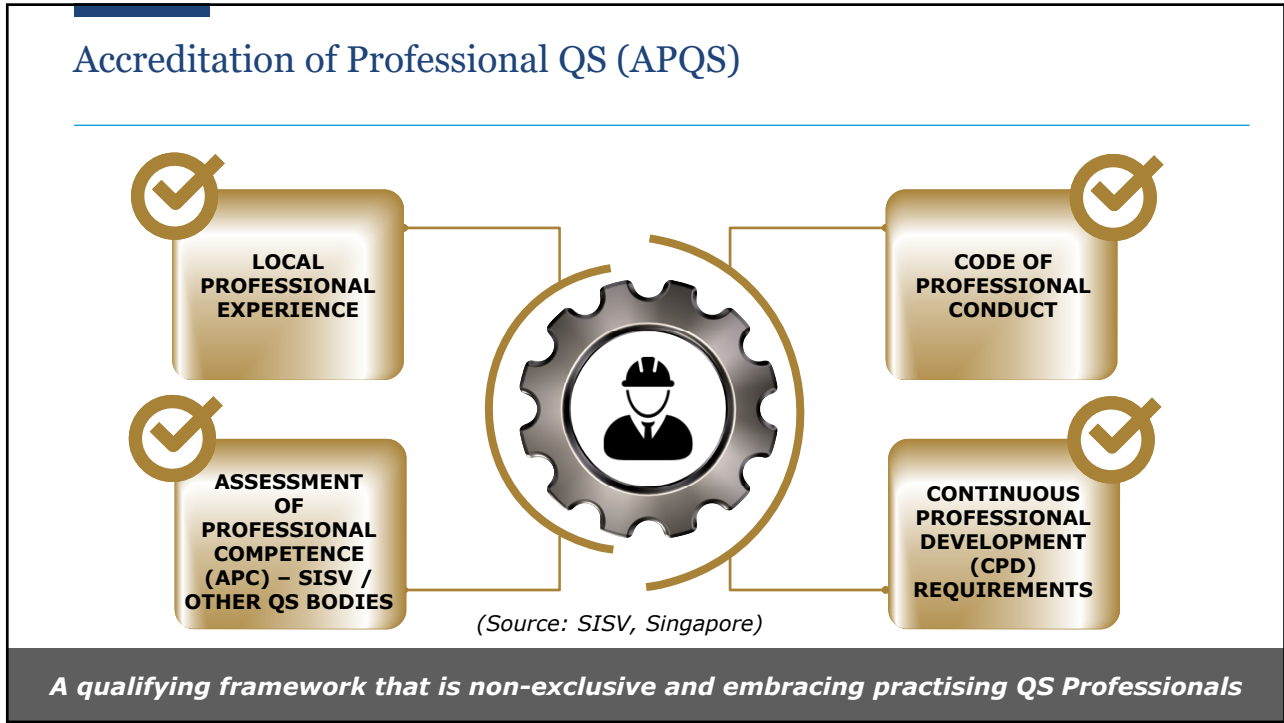
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Skills framework for built environment



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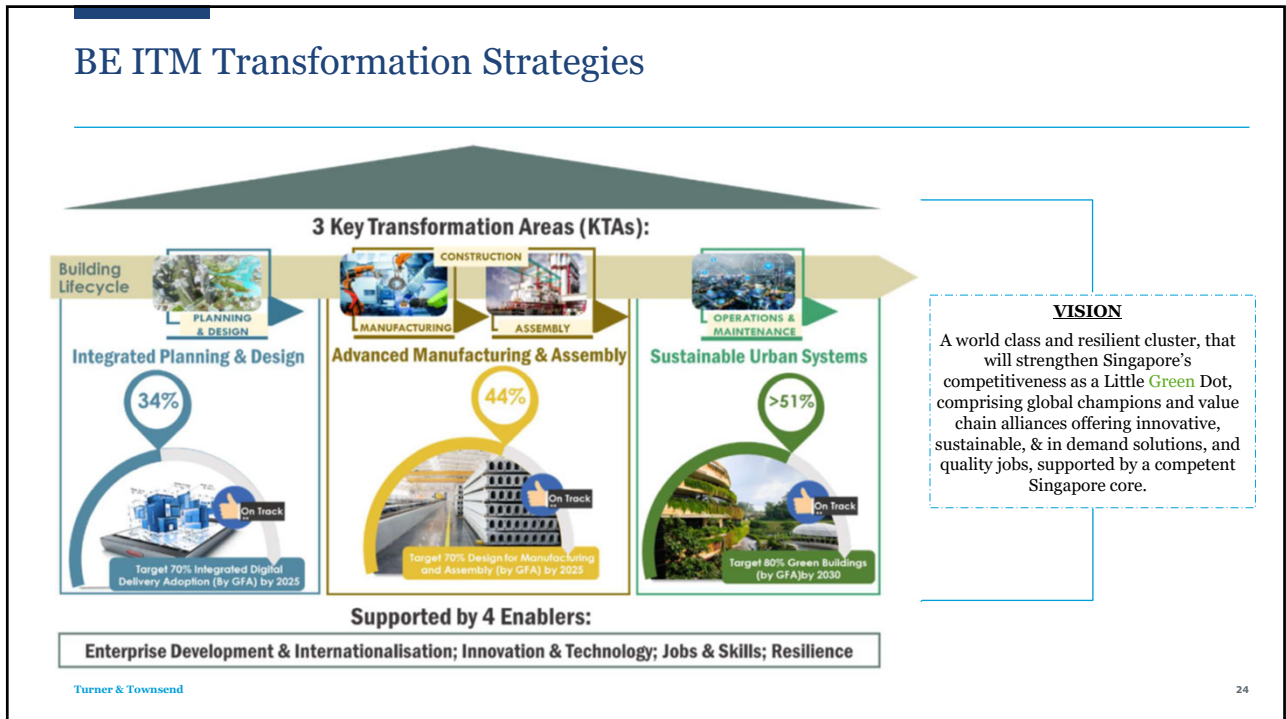
Accreditation of Professional QS (APQS)



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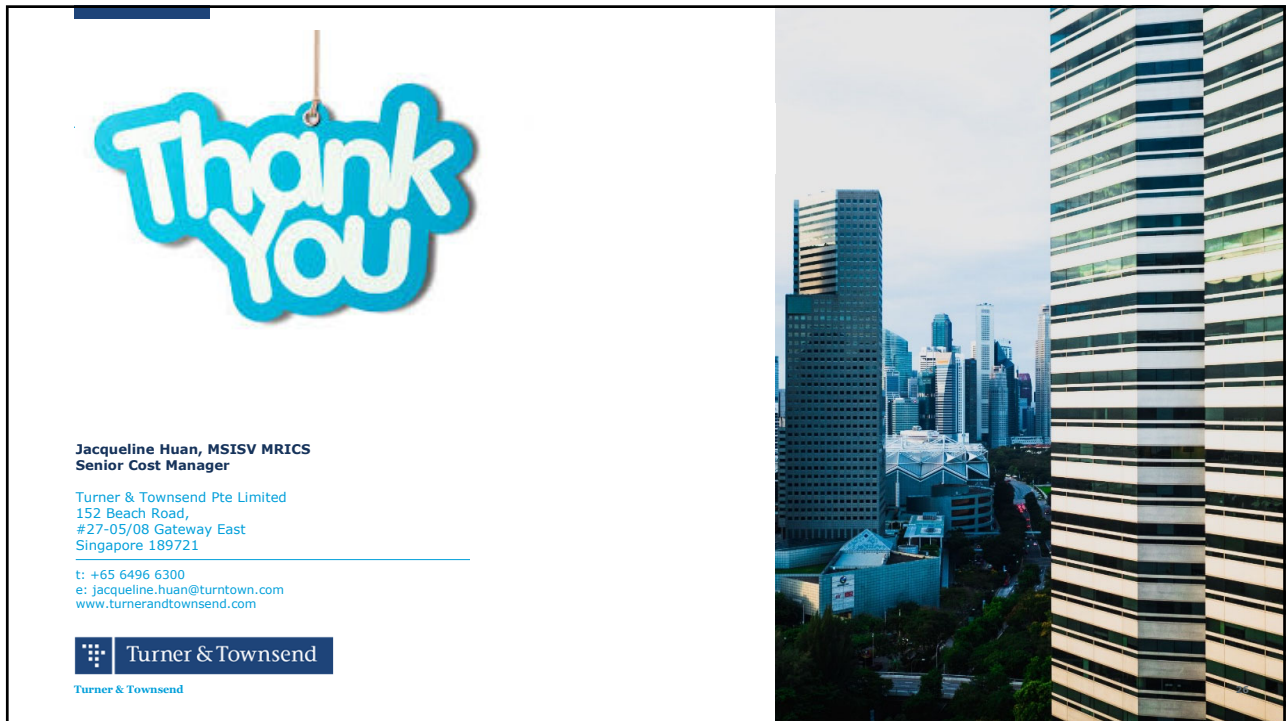
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