





# ICE BREAKFAST SEMINAR Manufacturing/Logistics "Just-In-Time"

November 19th 2019



### **ABOUT US**

Indochine Engineering is the leading engineering consultancy, continuously operating in Vietnam for over 20 years with a team of +100 staff.

Our track record includes over 350 projects including the factories of Hanesbrands, ICI Paints, Coca Cola, Interflour, & Amanda Seafoods.

Our services include engineering design, plant engineering, cost management, authorship supervision and project services.



Hotel



Residential



Retail



Education



Industrial



### **AGENDA**

**WELCOME & INTRODUCTION** 

### PRESENTATIONS:

- Manufacturing Logistics - "Just-In-Time" (Paul Lennen, Xact Solutions)

- VIETNAM INDUSTRIAL PROPERTY - OVERVIEW (JOHN CAMPBELL, SAVILLS)

- FACILITIES DEVELOPMENT - EARLY CONSIDERATIONS (WARREN GOODIE, ICE)

- SUSTAINABILITY IN THE INDUSTRIAL SECTOR (MAI NGUYEN, ICE)

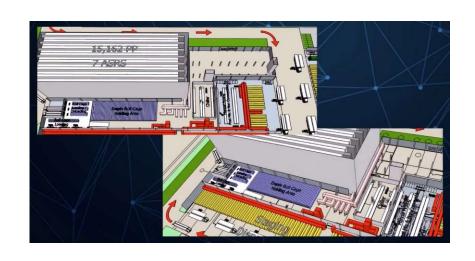
**QUESTIONS & ANSWERS** 

**CLOSE** 





### **MANUFACTURING LOGISTICS**



"JUST - IN - TIME"

Mr Paul Lennen
GENERAL DIRECTOR
XACT SOLUTIONS





## Presentation Topics

- 1. XAct Solutions Introduction
- 2. JIT and The Supply Chain
- 3. Case Study



### XAct Asia

solutions











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# JIT and The Supply Chain



# Why Talk About Just In Time?







# Origins of JIT and Lean

#### **Mass Production**







1: From mass manufacturing (Ford Model-T) to lean manufacturing (Toyota production systems). Source: Toyota GB (2015) and Wikimedia Commons (2015).

#### Variability

**Challenges** 

of mass-

production

"A customer can chose any colour they want, so long as it is Black"

From mass production to unit

production

#### **Quality Management**

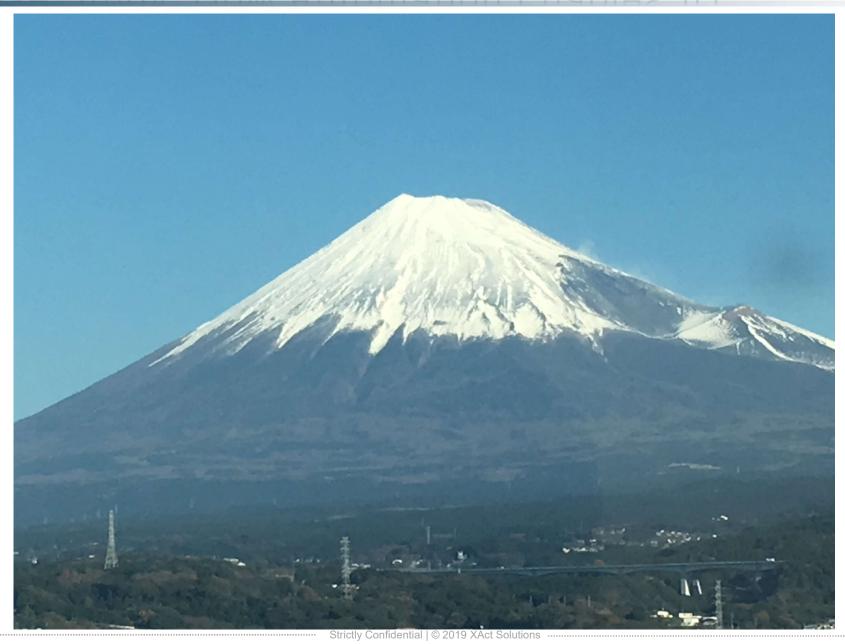
**Errors found post production** 

Defects are identified early and addressed immediately



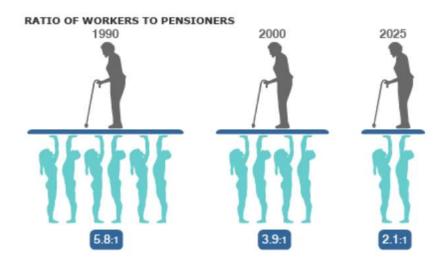
# Case Study: JIT and Automation







#### The Aging population crises in Japan



Source: By Madhav Ashar. Image source: Homepage. The Economic Transcript- June 2017 Issue

#### One of the most expensive property markets in the World

AUG 1, 2018

# Tokyo: Japan's capital and the world's biggest metropolis

Ziv Nakajima Magen of Nippon Tradings International discusses the Tokyo affordability paradox - Tokyo's rank as one of the most livable cities in the world, while also being one of the most expensive.



#### A large and complex supply chain





### The Challenges

Merging of businesses 9 to 1

Vending machines and Customer Points

~ 700,000 and ~ 320,000

Cases handled p.a. ~ **520M** 

Micro DC's ~ **350** 

Large DC's ~ 17

Plant DC's ~17

Market Highly Competitive &

**Highly Inflationary** 

Service *99.9%* 

#### The Supply Chain

### Customers

350,000 + 700,00

### Micro Manual

DC's

~370

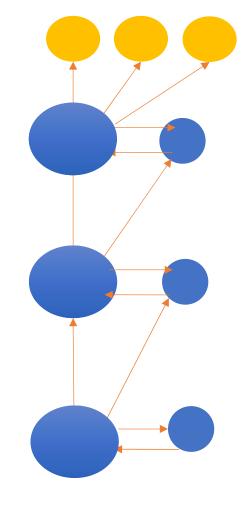
### Large Manual

DC's

~17

Plant DC's

~17





**Customers** 

350,000 + 700,00

**Micro Manual** 

DC's

~370

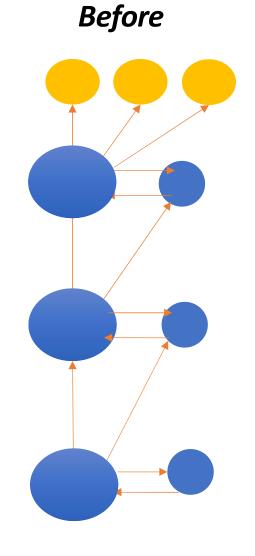
Large Manual

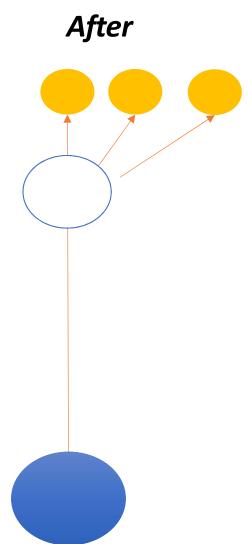
DC's

~ 17

Plant DC's

~17









350,000 + 700,00

### Micro Manual DC's

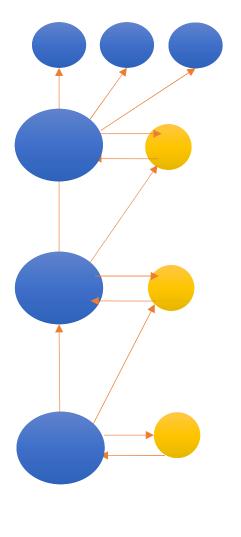
~ 370

### **Large Manual** DC's

~17

Plant DC's





#### The Strategic Questions ......

#### Question

Transition to

#### Can we consolidate Manual DC's?

Can we leverage available land adjacent to the Plants?

#### **Objective**

> Further reduce inventory and consolidate footprint

#### **Consideration**

With consideration to increasing LM stem time

- > to create enough scale to support investment in a fully automated solution?
- To eliminate one echelon of inventory
- **Automation business** cases can be challenging to achieve ROI targets
- With consideration to newly created transport lanes (net importer v. exporter)



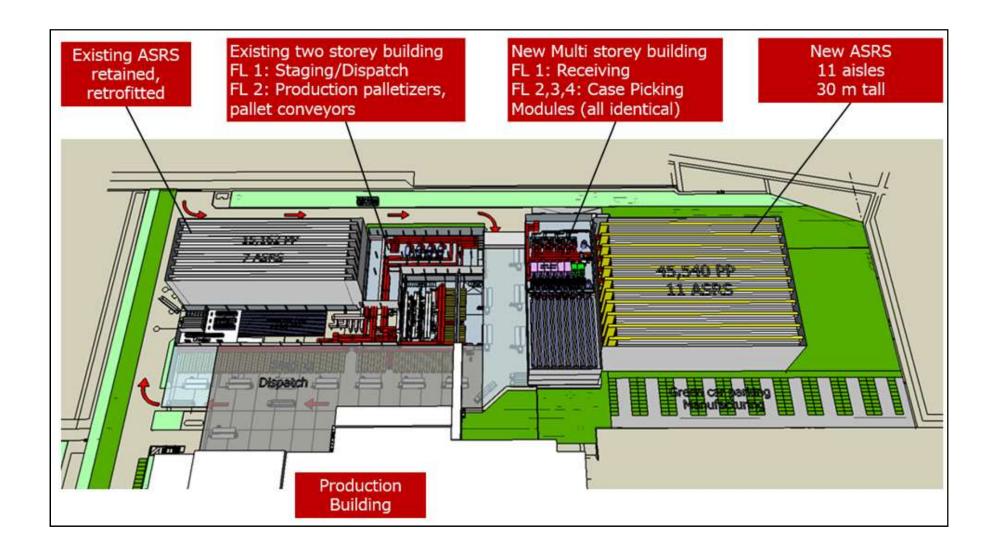


https://www.dcvelocity.com/articles/20180522-plus-one-robotics-launches-piece-picking-robot-for-package-sortation/



https://www.youtube.com/watch?v=w7rvZlv3H1w







**Customers** 

350,000 + 700,00

Micro Manual DC's

~370

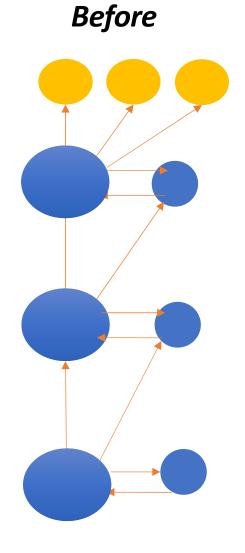
Large Manual

DC's

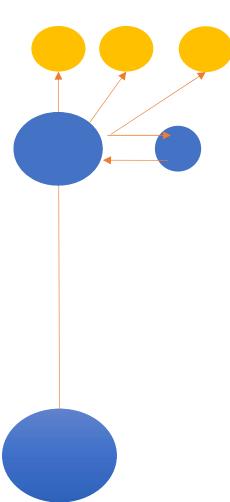
~17

Plant DC's

~17









**Customers** 

350,000 + 700,00

# Micro Manual DC's

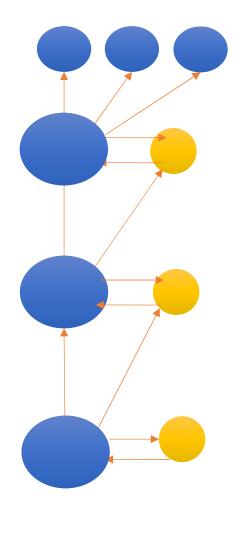
~ 370

# Large Manual DC's

~ 17

Plant DC's

~ 17



#### The Strategic Questions ......

#### Question

Transition to stockless sites

- Can we consolidate Manual DC's?
- Can we leverage available land adjacent to the

#### **Objective**

- To reduce
  inventory levels
  further, as well as
  time from supply
  to demand
- to create enough scale to support investment in a fully automated solution?
- To eliminate additional transport lanes?

#### **Consideration**

- With consideration to increasing LM stem time and site constraints considered
- With consideration to required investment and transport cube degradation
- With consideration to newly created transport lanes (net importer v. exporter)







### **INDUSTRIAL PROPERTY**



# **OVERVIEW**

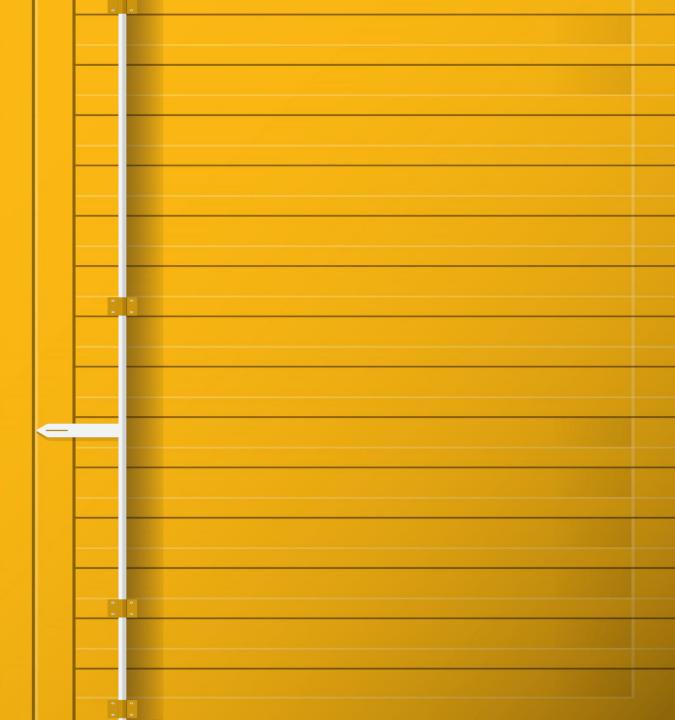
Mr JOHN CAMPBELL
INDUSTRIAL SERVICES DIRECTOR
SAVILLS PROPERTY GROUP



# INDUSTRIAL

# PROPERTY Savills

19th November 2019

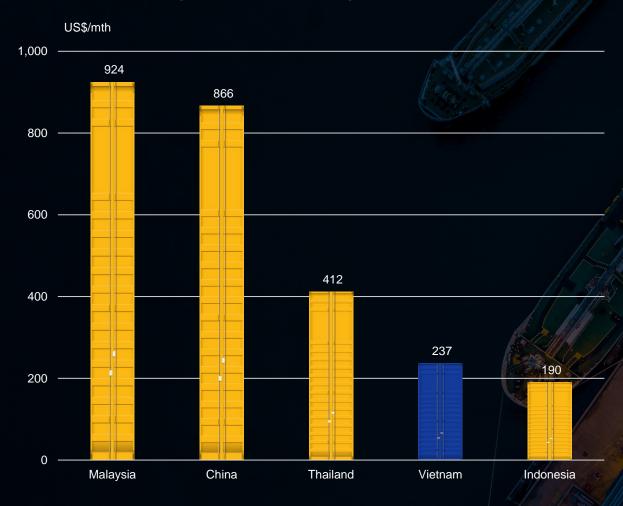




### H1/2019 – REGIONAL OVERVIEW

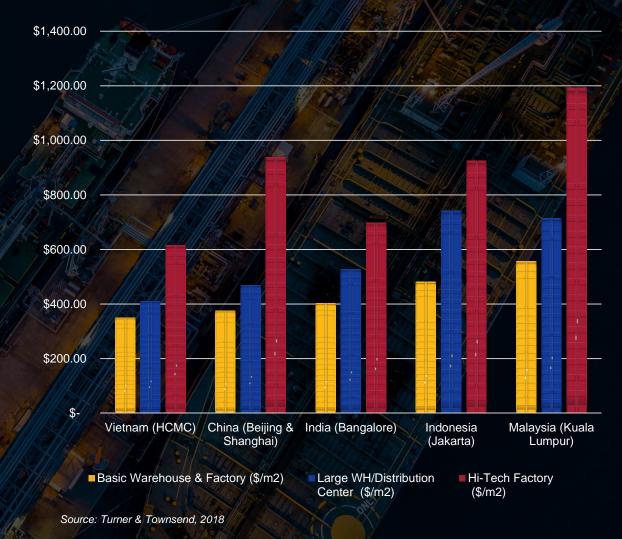


### Manufacturing workers' salary, 2018



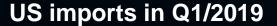
Source: Trading Economics, 2018

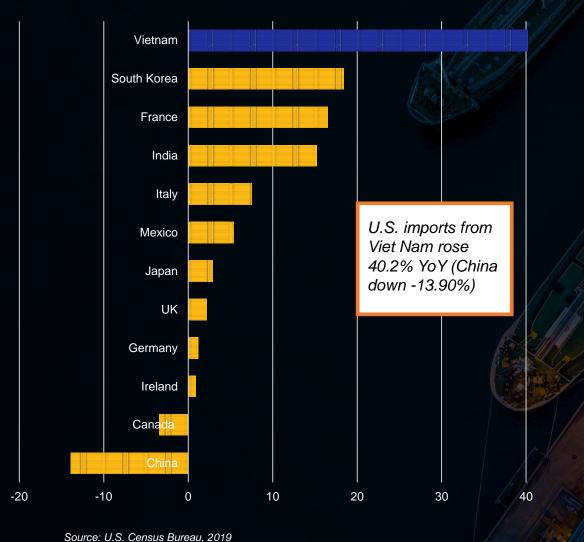
### Factory construction costs, 2018



### H1/2019 – REGIONAL OVERVIEW

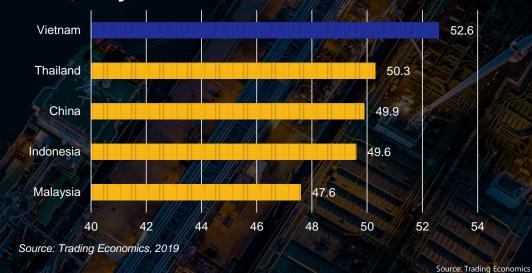




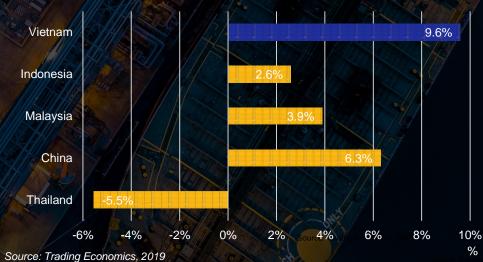


### **PMI**, July 2019

50



### **Industrial Production, July 2019**



### INDUSTRIAL DRIVERS

### **Main Drivers:**

- Multiple free-trade agreements
- Labor costs: less than half of China
- Affordable land price and sea freight
- Favorable corporate income tax rates
- >96 million people
- Near source and destination markets
- Stable government, fast growth rate and improving business climate



### Q3/2019 - FDI & INDUSTRIAL LAND SUPPLY



**Manufacturing & Processing FDI** 

**69.1%** of total FDI

US\$18.09 billion

Industrial Parks (IPs) and Economic Zones (EZs)

FDI projects; with

estimated newly registered capital totalling US\$10.1 billion

IP & EZ Supply

327 IPS - 96,100

Industrial area of 65,700 ha

256 operational IPs: 75% occupancy

71 IPs under construction, site clearance and compensation

**lorth Economic** Duong Hai Phong **Central Economic** Zone Thua Thien Hue Da Nang Quang Nar Quang Ngai Binh Dinh South Economic Zone Binh D Ba Ria Vung Tau

Source: Ministry of Planning and Investment (MOPI), 2019



Developed transportation network links

Prime industrial land between new infrastructure developments

Investment from China

Heavy industry focus



South

Economic and industrial center of VN

Near the biggest commercial port in VN

Educational institutions driving skilled labor

Diversified sector investment











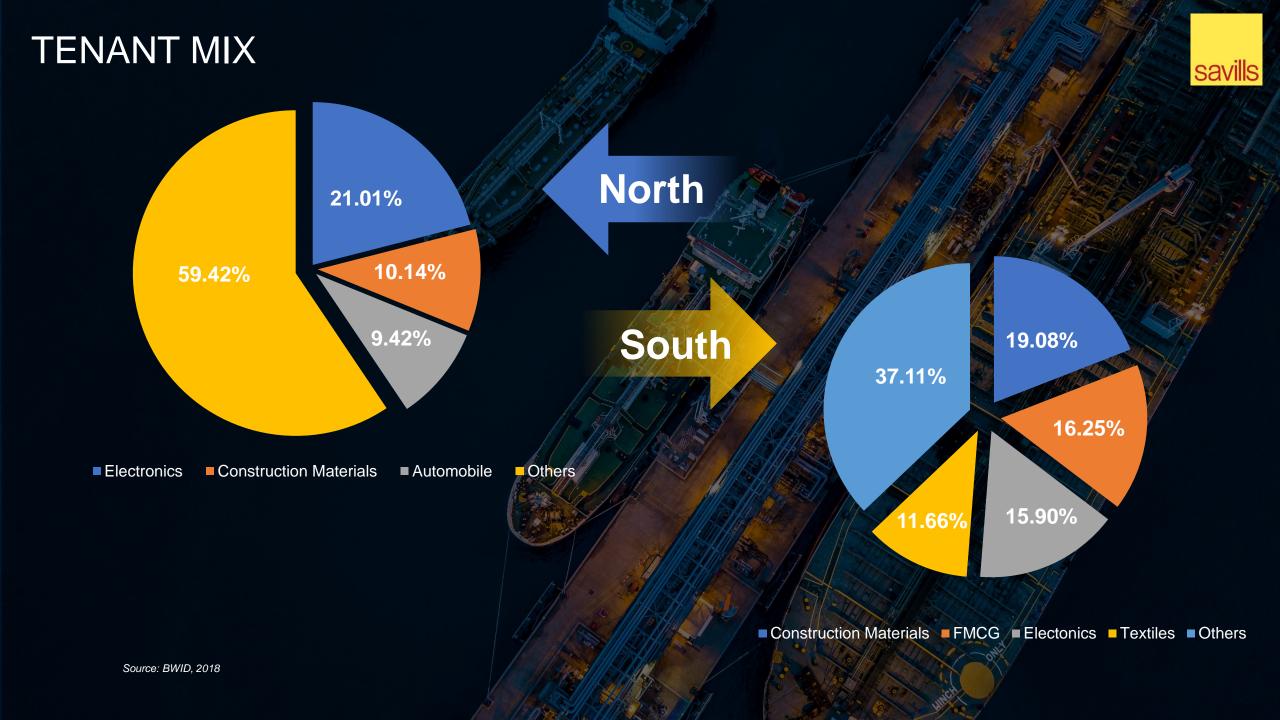














### **U.S.-CHINA TRADE TENSIONS**

- Viet Nam key beneficiary
- Influx of foreign and mainland Chinese companies
- Incoming hi-tech and electronic manufacturers

### **Remaining Challenges:**

- Tariffs hurt Vietnam as a supplier of inputs to China
- Low-value production from China competing for labor
- Supply chains cannot be adjusted in short order



...and threatens 10% tariffs on another US\$300 billion worth of goods







Moved

savills



**Under consideration** 

**FOXCONN** 

SHARP

TCL

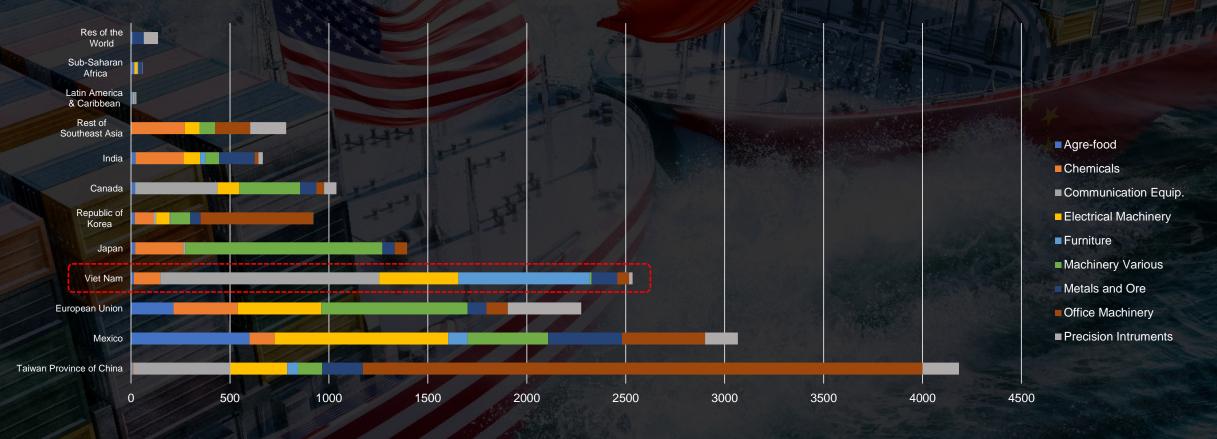
**Nintendo**®

Lenovo

### H1/2019 - U.S.-CHINA TRADE DIVERSION EFFECTS

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Vietnam the biggest winner in SEA

VN key product beneficiaries:

- Communications equipment;
- Furniture;
- Electrical Machinery.

Considerable variance both across countries and sector emphasizes the <u>inability of one economy</u> to match China's production capacity.

# H1/2019 - KEY TRANSACTIONS



Project	ect Nationality Indus		Province	Investment (US\$)
Beerco Limited	<b>%</b>	Tu Liem Industrial Cluster	Hanoi	4 bil
Goertek Co., Ltd.	**	Que Vo Industrial Park	Bac Ninh	260 mil
ACTR Company Limited		Phuoc Dong Industrial Park	Tay Ninh	280 mil
Advance Vietnam Tire Co., Ltd		Long Giang Industrial Park	Tien Giang	214 mil
Royal Pagoda Private Limited		VSIP Nghe An	Nghe An	200 mil
Meiko Electronics Vietnam Co., Ltd		Thach That -Quoc Oai Industrial	Hanoi	200 mil
Universal Alloy Corporation		Da Nang Hi-Tech Park	Danang	170 mil
TTI, Inc.		Saigon Hi-Tech Park (SHTP)	нсмс	150 mil
Changshin Vietnam Co. Ltd		Tan Phu Industrial Park	Dong Nai	100 mil

### RISE OF RENTAL OPTIONS



### Rental developers:

Developer	Nationality	Total Area (ha)	RBF Sites	Provinces
BW Industrial Development		247	10	HCMC, Binh Duong, Dong Nai, Bac Ninh, Hai Duong, Hai Phong
KTG Industrial Development		120	8	Dong Nai, Hanoi, Bac Ninh
Daiwa House Vietnam	0	12.6	2	Dong Nai
Boustead Projects Land		6	1	Dong Nai
Gaw NP Industrial				Upcoming

- Quick market entry
- Less capital

- Escalating price of land
- BTS Tailored solutions

- Perfect for SMEs
- Flexible exit strategy

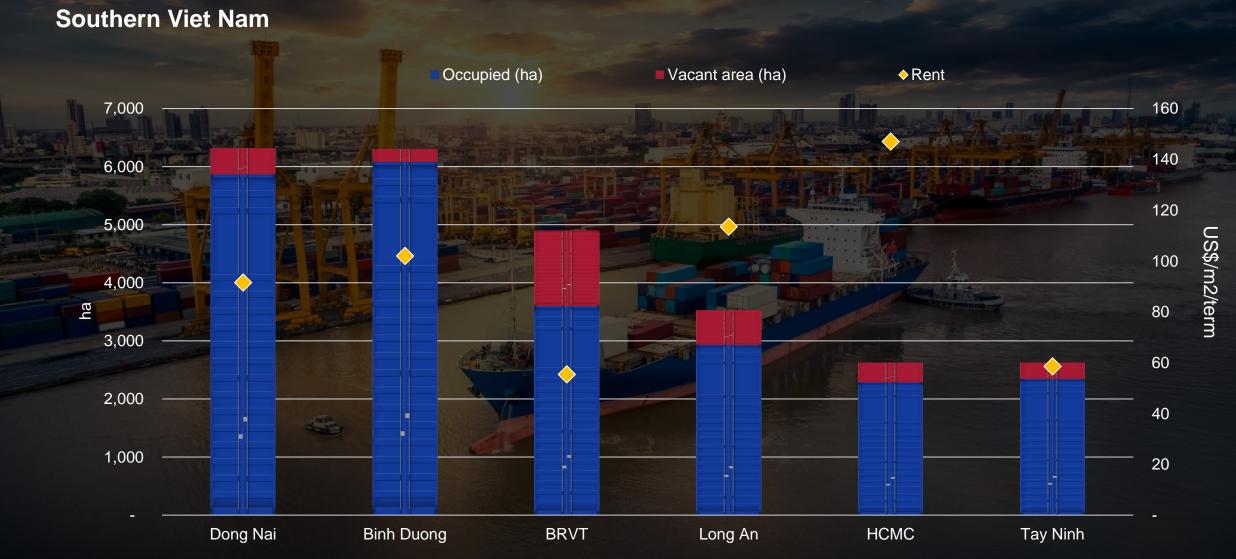
#### INDUSTRIAL LAND LEASING PROCESS savills General Steps 01 03 04 05 06 Apply for IRC Choose land Sign MOU or Apply for the Hand over of Sign official Appraisals and Begin (15 - 30)and negotiate Reservation Land Use Right levelled land leasing applications for construction, Certificate Fire Protection days) & ERC the price Agreement for ready for contract: 30 install (15 - 30)(LURC ie. 40% Plan, the land and pay construction equipment and deposit: 10% -Redbook) Environment machinery days) payment

40%

Protection Plan, Construction License

### H1/2019 – SUPPLY & PERFORMANCE





#### H1/2019 – SOUTHERN PROVINCIAL INDEX



	H1/2019 FDI (US\$)	2019 PCI (Rank/province)	Total Area (ha)	Total Leasable Area (ha)	Projects	Occupancy	Rent
Ho Chi Minh City	3.08B 2 <sup>nd</sup> highest	<b>65.34</b> 10 <sup>th</sup> /63	4,703	2,620	22	24.3% YoY	stab <b>l</b> e
Binh Duong	<b>1.37B</b> 3 <sup>rd</sup> highest	<b>66.09</b> 6 <sup>th</sup> /63	10,040	6,296	30	27.6% YoY	<b>○</b> 54.6% YoY
Dong Nai	<b>1.23B</b> 4 <sup>th</sup> highest	<b>63.84</b> 26 <sup>th</sup> /63	9,216	6,317	31	20.8% YoY	21.1% YoY
Long An	<b>268M</b> 15 <sup>th</sup> highest	<b>68.09</b> 3rd/63	5,827	3,523	21	3.8% YoY	<b>○</b> 26.7% YoY
Ba Ria- Vung Tau	<b>680M</b> 7 <sup>th</sup> highest	<b>64.02</b> 21st/63	8,924	5,168	11	1.4% YoY	7.8% YoY
Tay Ninh	<b>714M</b> 26 <sup>th</sup> highest	<b>64.54</b> 14 <sup>th</sup> /63	3,390	2,619	6	63.6% YoY	31.1% YoY

#### H1/2019 – SUPPLY & PERFORMANCE





#### H1/2019 – NORTHERN PROVINCIAL INDEX



	H1/2019 FDI (US\$)	2019 PCI (Rank/province)	Total Area (ha)	Total Leasable Area (ha)	Projects	Occupancy	Rent
Hanoi	<b>4.87B</b> 1st highest	<b>65.40</b> 9 <sup>th</sup> /63	3,432	1,624	10	<b>6</b> 8.5% YoY	<b>6</b> 8.6% YoY
Bac Ninh	1.01B 5 <sup>th</sup> highest	<b>64.50</b> 15 <sup>th</sup> /63	5,107	3,651	13	6.3% YoY	13% YoY
Hung Yen	<b>299M</b> 13 <sup>th</sup> highest	<b>60.66</b> 58 <sup>th</sup> /63	1,704	1,226	8	6.2% YoY	6.7% YoY
Hai Phong	536M 9 <sup>th</sup> highest	<b>64.48</b> 16 <sup>th</sup> /63	4,658	2,656	11	O 10% YoY	<b>6</b> 4.5% YoY
Hai Duong	<b>444M</b> 10 <sup>th</sup> highest	<b>60.98</b> 55 <sup>th</sup> /63	1,449	980	8	18.8% YoY	29.4% YoY
Vinh Phuc	<b>227M</b> 16 <sup>th</sup> highest	<b>64.55</b> 13 <sup>th</sup> /63	1,391	997	6	11.1% YoY	8.8% YoY

#### SUFFICIENT CAPACITY



#### Land supply

Despite occupancy increasing YoY in key provinces,

- Existing land and upcoming projects;
- Developers: converting agricultural land for industrial usage;
- New locations: e.g. central economic zone with competitive pricing

#### **Labor supply**

- Concerns stem from "low-value-added" manufacturers e.g. garment and furniture;
- 10% of workforce in FDI sector, 40% in agricultural industry = shift "from the farm to the factory", fueling industrialisation.

#### LOGISTICS OVERVIEW



#### 1970's to Now

Tactical & Service Driven

Strategic & Solution Driven

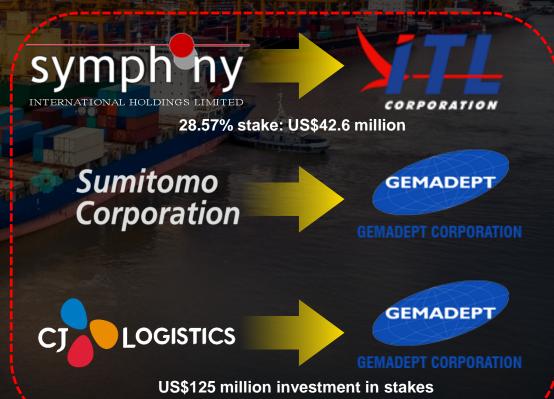
- 3PL, Retail/E-Commerce and Manufacturing Main Drivers of the warehousing market
- Demand driving up warehouse prices near CBDs, and limiting 'last-mile' delivery supply

#### **Logistics and Warehousing Market:**

- To be valued at US\$86.7 billion by 2022
- CAGR: 13.3% in 2018 2020
- Approx. 1,300-1,500 enterprises providing logistics services

#### Key M&A's

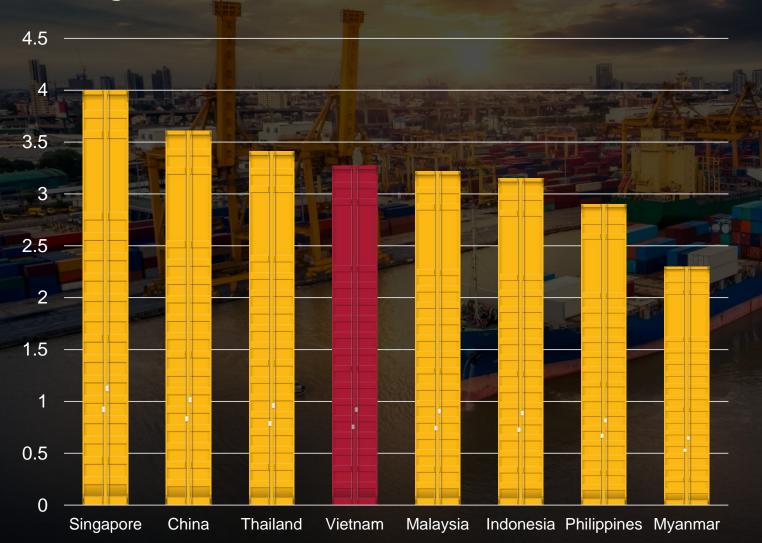
Foreign companies: up to 70%-80% of Vietnam's logistics market due to recent merger and acquisition (M&A) deals, leaving domestic firms struggling with fierce competition.



#### LOGISTICS PERFORMANCE

#### savills

#### **2018 Logistics Performance Index Score**



In 2018, Vietnam ranked 39<sup>th</sup> out of 160 countries in the World Bank's Logistics Performance Index, jumping from 64<sup>th</sup> place in 2016

"Among lower-middle-income countries, large economies such as India and Indonesia and emerging economies such as Vietnam stand out as top performers"

Connecting to Compete: World Bank 2018

#### CHALLENGE FOR INDUSTRIAL savills **Productivity** Dependency Consistent Logistics costs Rapidly increases in levels and on foreign - one of the increasing shortage of investment minimum highest in the occupancy skilled labor and trade Asian region costs near wage city locations

#### OUTLOOK



#### Recommendations for FDI Strategy for 2020-2030:



Creating a national skills development plan;



Modernizing investment promotion activities for priority sectors;



Implement supporting policies for local firms;



Open service sectors such as education, logistics and financial services;



Set up a new FDI management agency with higher budget, capacity and authority;



Review and adjust current investment incentives and policies to ensure FDI quality, and;

Prepare for Industry 4.0.

#### CONCLUSION



Industrial market is performing well in H1, attracting significant foreign investment

Key drivers: low labor costs, land prices, CIT incentives, FTA's, location, young population

Current land supply facilitating manufacturing investment, upcoming projects needed

More developers offering flexible rental solutions: RBFs and BTS

Growing retail and e-commerce market driving logistics sector

US-China Trade War still benefiting Vietnam

Large industrial transactions in new industries, boosting investor confidence

#### CONTACT Mr. John Campbell Manager – Industrial Services JCampbell@Savills.com.vn Tel: +84 (0) 986 718 337 DISCLAIMER Although every care has been taken in preparing this proposal, Savills does not verify its accuracy. Information, opinions and forecasts in this proposal depend on the accuracy of any information and assumptions on which they are based, and on prevailing market conditions, for which Savills does not accept responsibility. No representations or warranties of any nature whatsoever are given, intended or implied about this proposal, any information, opinions and forecasts contained within this proposal or the accuracy or enforceability of any documents referred to in this proposal. Savills will not be liable for any errors. Savills will not be liable, including for negligence, for any direct, indirect, special, incidental or consequential losses or damages arising out of or in any way connected with use of or reliance on anything in this proposal. This proposal does not form part of or constitute an offer or contract. Recipients of this proposal should rely on their own enquiries about its accuracy. All images are only for illustrative purposes. Confidential information This proposal is the confidential information of Savills; is strictly for the intended recipient and must not be

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#### **FACILITIES DEVELOPMENT**



## **CONSIDERATIONS**

Master Planning
Technical Due Diligence

Mr WARREN GOODIE

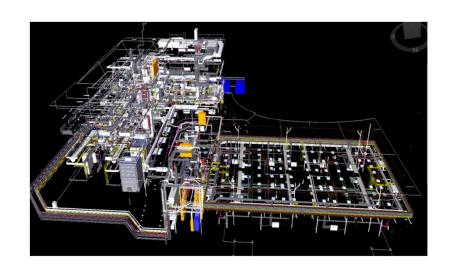
MANAGING DIRECTOR

INDOCHINE ENGINEERING





#### **FACILITIES AND SERVICES - MEP**







C:\Users\warren\Desktop\Overall.avi





#### **MECHANICAL SERVICES**

- Fans & AHU's
- Ventilation
- Air Filtration
- Ducts and louvres





- Refrigeration
- Chiller Systems
- Humidity Control
- Temperature Control



#### **ELECTRICAL SERVICES**

- Back up Generation
- Electronic Security
- Lightning Protection
- Cable Trays and Support





- Mains Connection
- Panels and Switchboards
- Lighting and GPO's
- Data Cabling, Comms



#### PROCESS SERVICES



- Process Water Systems
- Compressed Air
- Flammable/Purge Gas
- Trade Waste Systems

- Modular boilers/steam systems
- Water Treatment / Purifiers
- Process Control Systems





#### JIT DELIVERY & AUTOMATION - THE TRANSITION



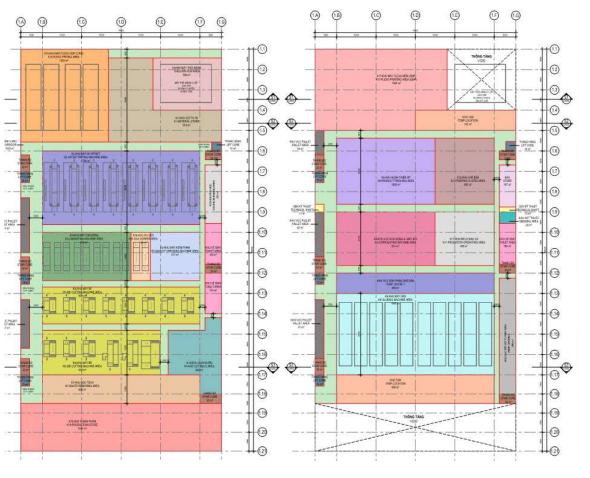
MANUAL SEMI-AUTO MOSE
AUTOMATIC

- Low Labor vs Capital Costs
- Tipping Point to Automation
- Local Labor Availability
- Optimum Solution and;
- Transition / Master Plan





#### **MASTER PLAN - FOR FUTURE AUTOMATION**



- Product Flow
- Non-Product Flow
- Production Variables
- Equipment Layout (Manual vs Later Automation)
- Transport System (AGV)
- Interfacing Equipment
- Control System Interface
- Guidance System
   (e.g. AGV Embedded Wire, RFID, Laser)
- Vehicle Charge Points



#### **NEW FACILITY DESIGN - FLOOR LOADS**



- Heavy Equipment
- Intricate Footings
- ASRS Load Concentration (can be x 2.5 3.0 of conventional floors)
- Vehicle Wheel Loads
   (e.g. AGV Solid Tire)







#### FLOOR FINISHES - DO IT ONLY ONCE

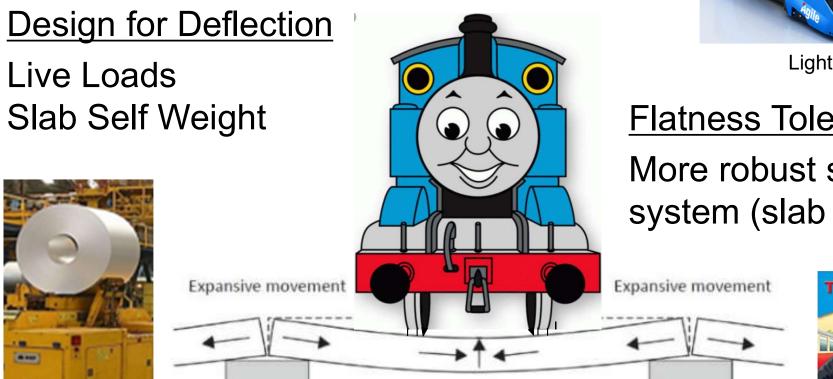


- Surface Finish
- Control Joints
- Abrasion Resistance
- Flatness Tolerances
   (e.g. Typically < 3mm in 3m AGV's)</li>





### FLATNESS AND DEFECTION Suspended Slabs

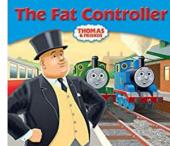


Compressive movement



Light Loads - 300kg

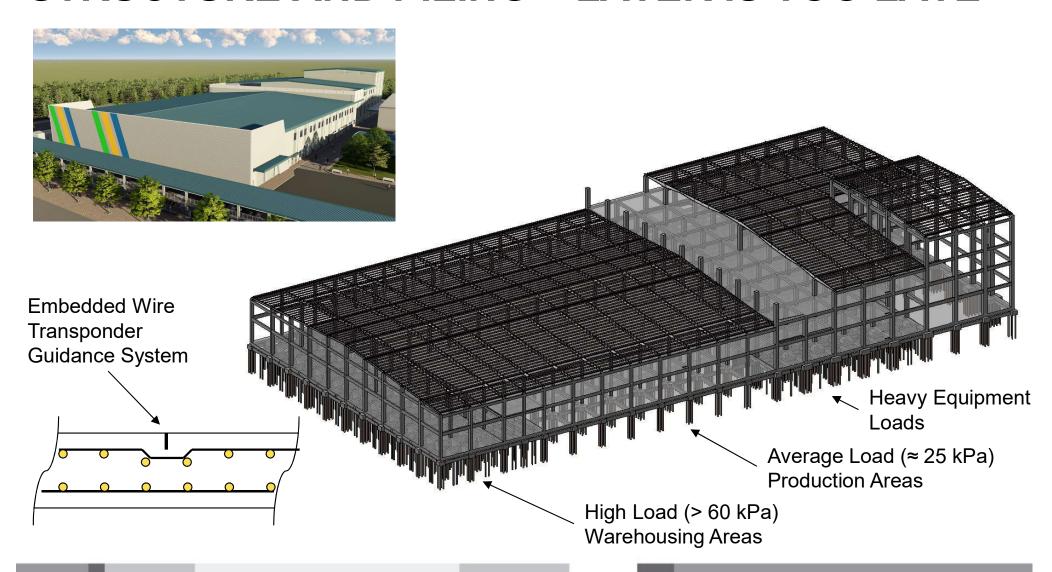
Flatness Tolerance More robust structural system (slab & beams)



Heavy Loads - 20T



#### STRUCTURE AND PILING - LATER IS TOO LATE



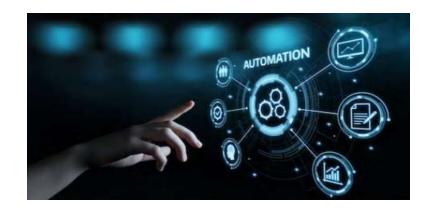


#### **FACILITY & OPERATIONS DEVELOPMENT**

#### **Master Planning**

Future Proofing Facilities for Later Automation

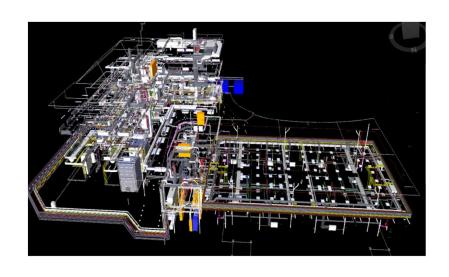
# Technical Due Diligence / Preliminary Engineering Sufficient for the Master Plan







#### SUSTAINABILITY IN THE INDUSTRIAL SECTOR

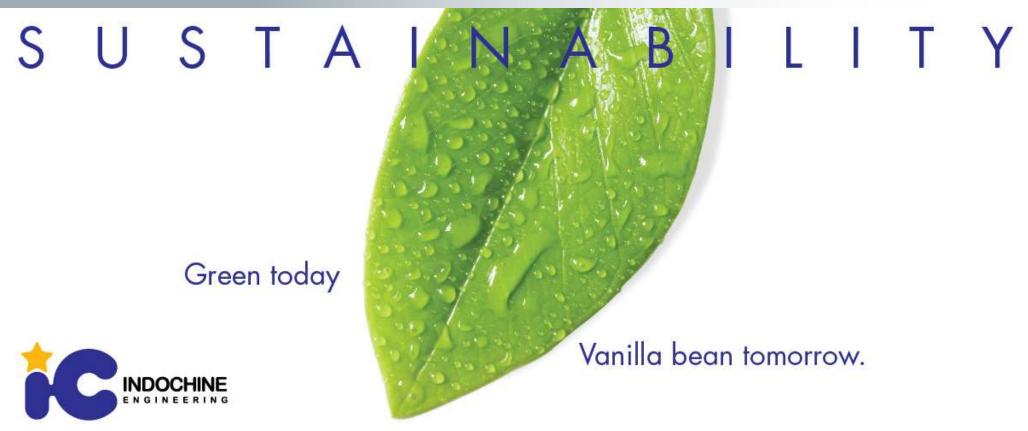




# Ms MAI NGUYEN ENVIRONMENTAL SUSTAINABILITY INDOCHINE ENGINEERING



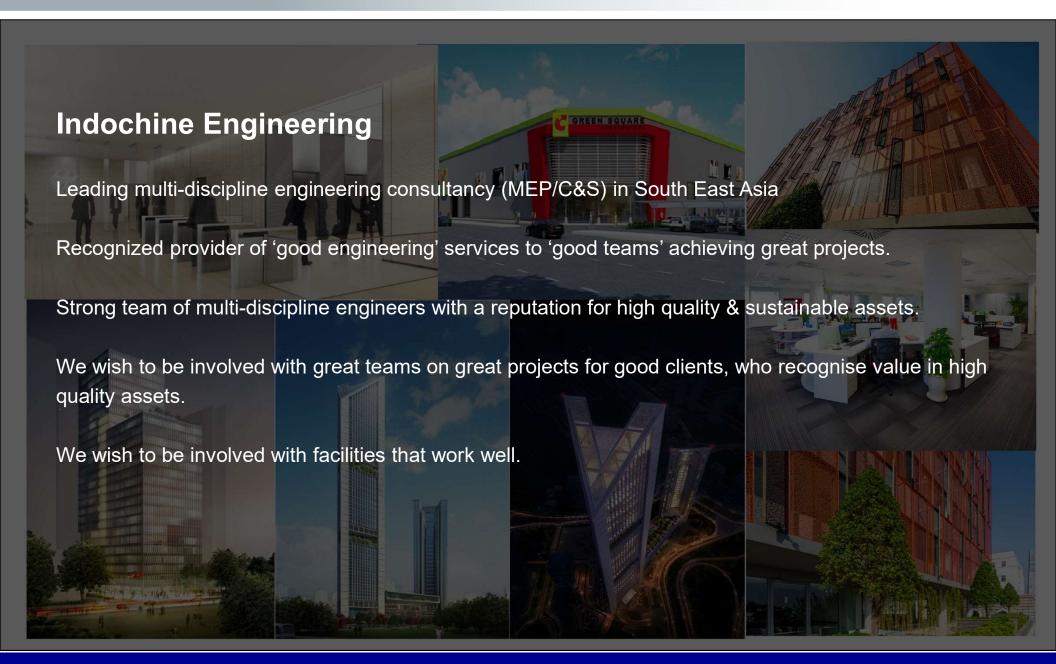




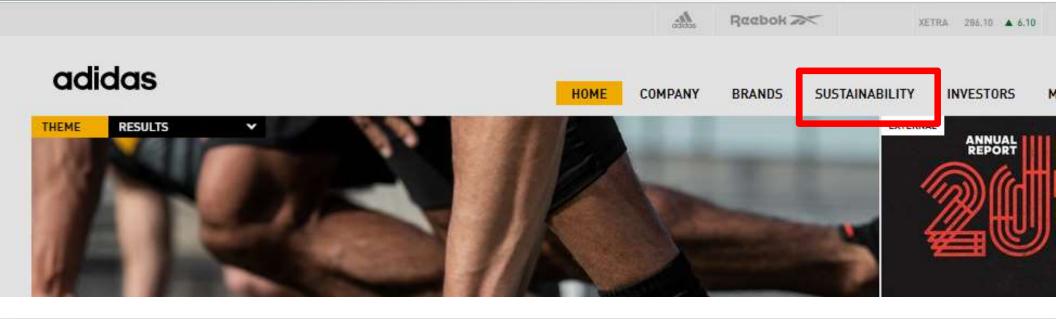
# An All-inclusive Approach to Sustainability in the Industrial Sector

Nov 19<sup>th</sup>, 2019

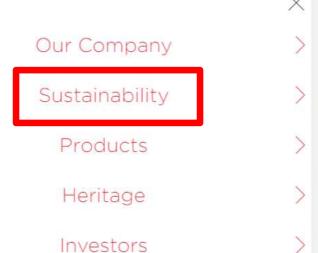








a coca-cola.com















Circular economy, zero-net, Al



03

Innovation and technology:

i.e. waste to energy, renewable energy



02

Improve: energy efficiency, waste reduction, water saving



Do things right:

i.e. Ensure air treatment, waste water treatment are environmentally implemented







From Waste to Energy







# Do things right





simply good practices of what we have been doing i.e. Ensure air treatment, waste water treatment are environmentally implemented





## Improvement



- ✓ Good MEP design
- ✓ Good façade design
- ✓ Heat recovery
- ✓ High COP chiller
- ✓ Inverter plant
- ✓ Good natural ventilation
- ✓ Energy efficient light bulb
- √ Smart control

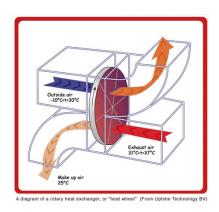






Photo source: https://www.pngfly.com/

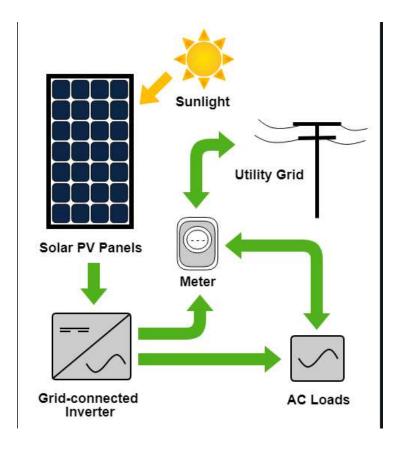




# Innovation& technology



- ✓ On grid No battery
- ✓ Sell to EVN 9.35Cent/kWh
- ✓ Capex ~ 78cent/1w
- √ 6sqm ~ 1kwp
- ✓ Efficiency ~ 20%



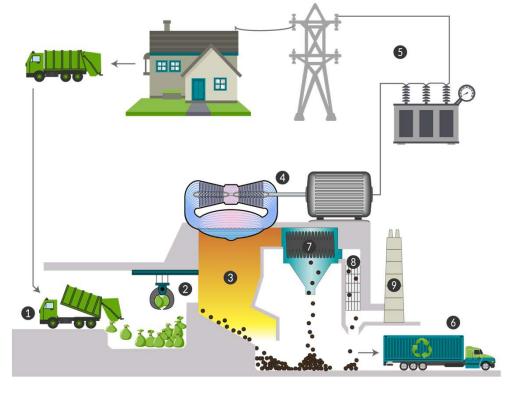




# Innovation& technology



- ✓ Market potential: 320 MW energy generated from waste. 6000 MW in 2050
- ✓ Current projects total capacity 9MW (Da Phuoc, Can Tho, Hau Giang)



Source: https://cecopower.com/waste-to-energy/



#### **Artificial Intelligence**

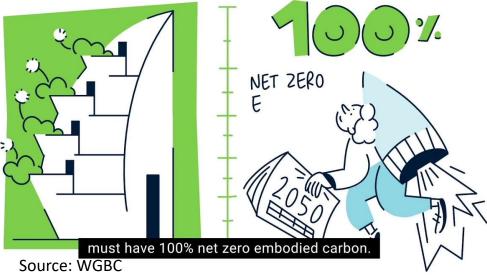


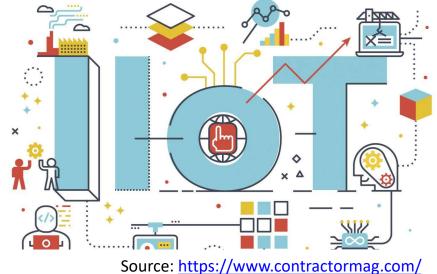




## **CIRCULAR** ECONOMY





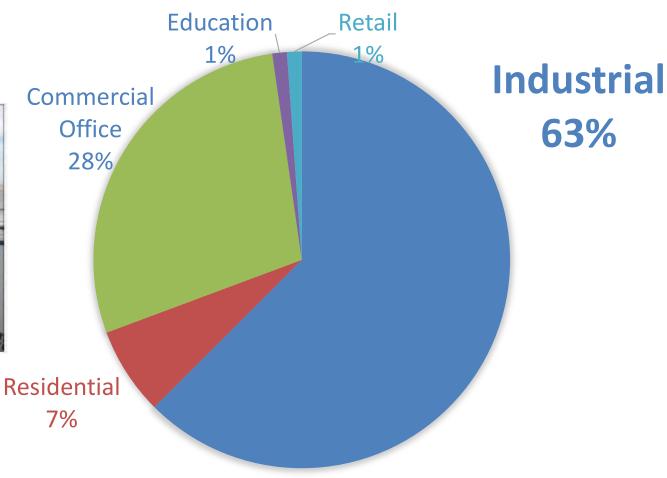




#### **LEED PROJECTS IN VIETNAM BY SECTOR**









# Just-in-lime Thank you!



## **THANK YOU**