

IMPACT OF INCREASED COMPETITION FROM HIGH VALUE COST CENTERS ON THE US AND GLOBAL E&C INDUSTRY

43rd Annual ECC Conference

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JW Marriott Desert Ridge, Phoenix, AZ

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Are emerging market contractors credible competitors for major international projects?

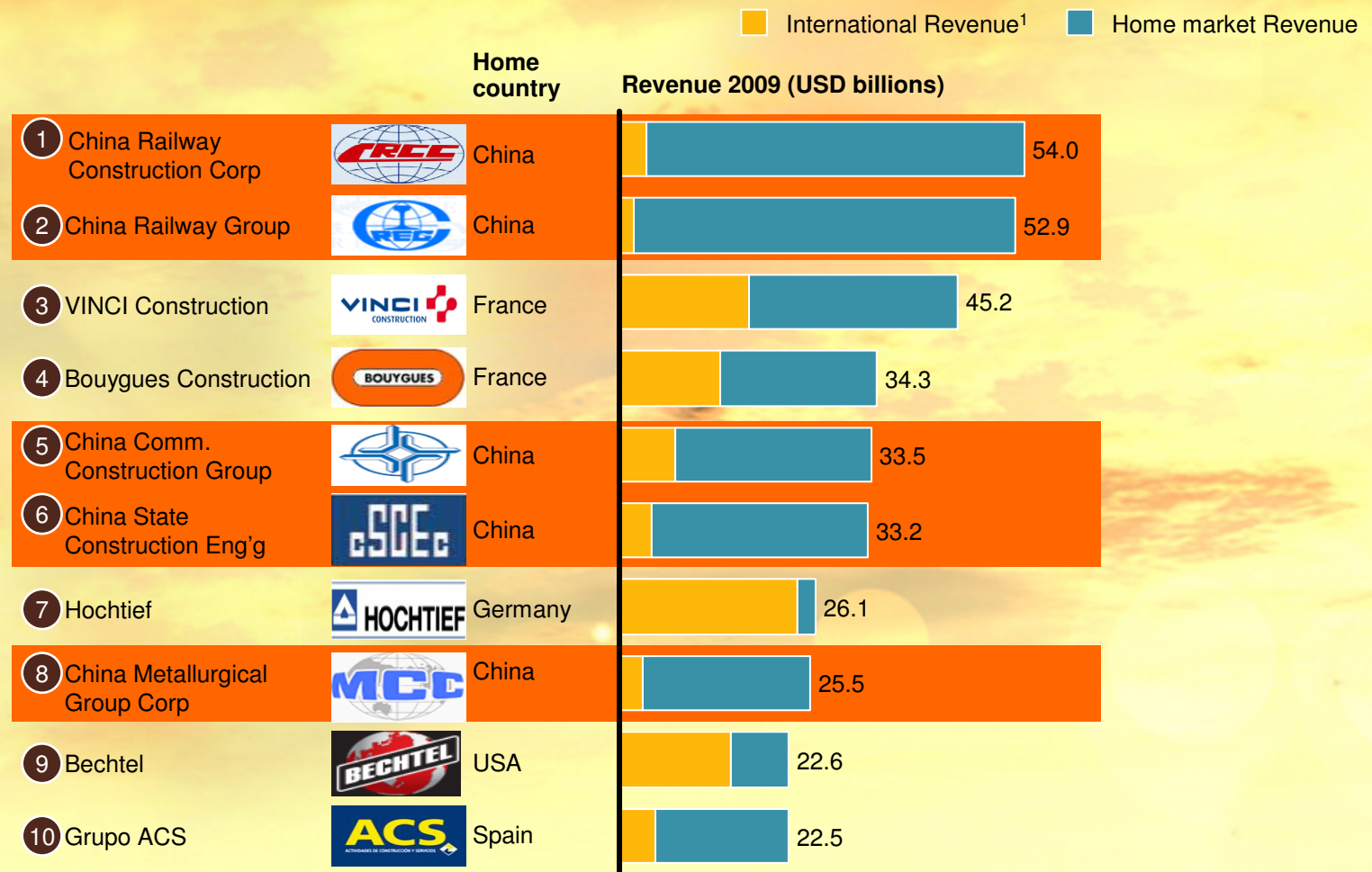
With the colleagues near you, please discuss what techniques emerging market contractors can use to compete for international projects

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Today, China's leading construction companies have scale but lack international presence



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¹ Share of revenue obtained outside of the home country in total sales

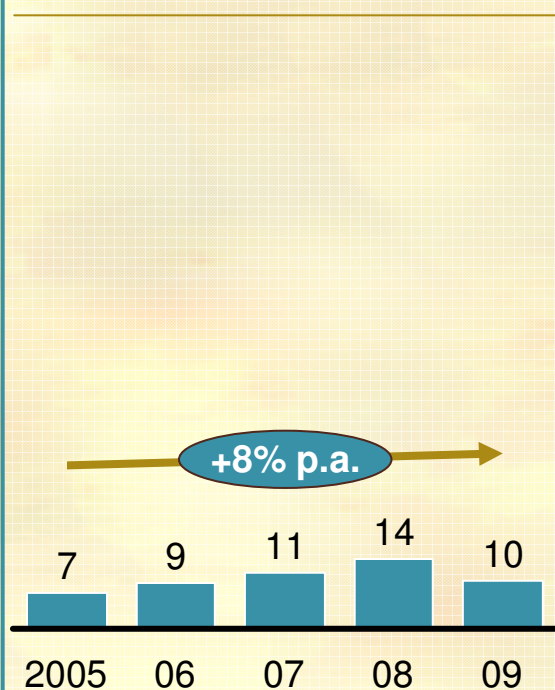
SOURCE: ENR Sourcebook Dec 2010

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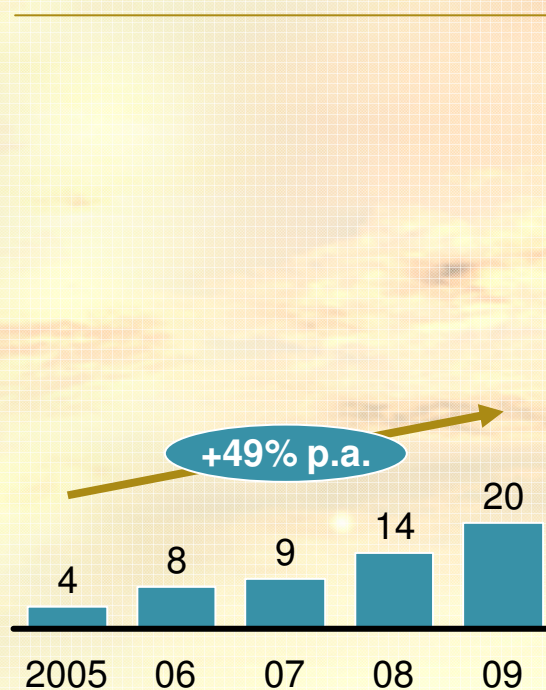
International revenue growth at the top 5 Chinese firms outstrips at leading Japanese and western firms

Revenue in USD Billions

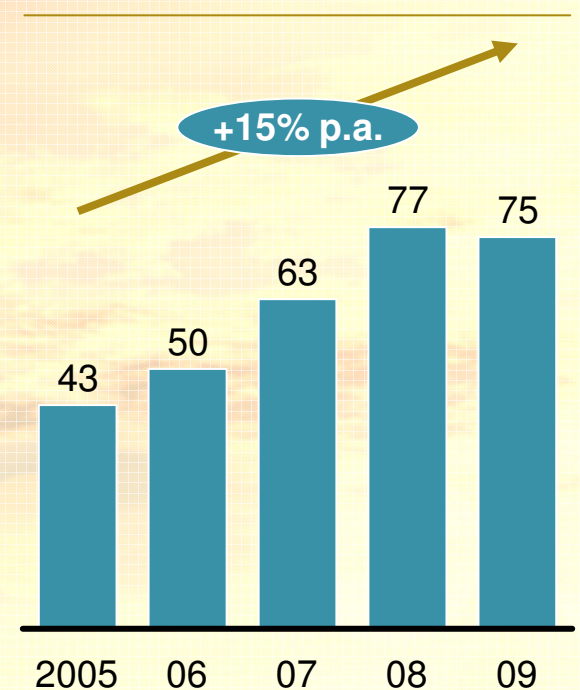
Top 5 Japanese Overseas² revenues



Top 5¹ Chinese Overseas² revenue



Top 5¹ Western Overseas revenues



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Indian and Chinese fabricators can make important equipment for world-class refineries



World's largest FCC reaction regenerator by L&T



World's largest reactor by CFHI Dalian



665 MT HGCO reactor for Valero St. Charles refinery in the US by G&B



CCR with UOP technology by Lanshi

Indian and Chinese fabricators are able to manufacture according to global standards and have good delivery track record according to end-users

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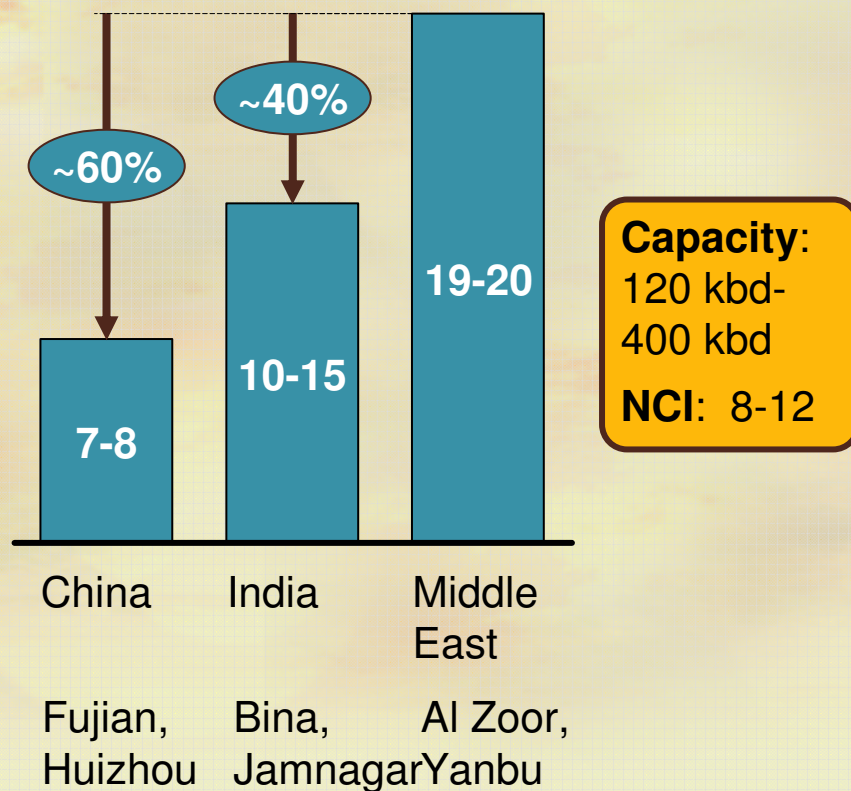
Sources: Company Web sites, expert interviews, team analysis

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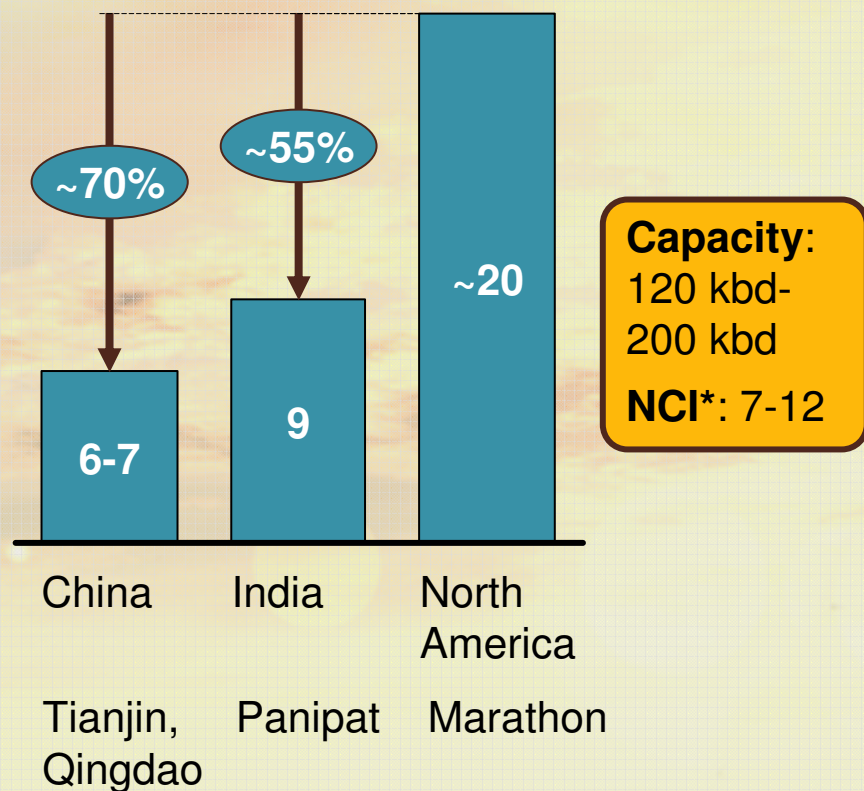
Chinese and Indian refining projects have significantly lower capex compared to comparable projects in mature markets

\$ mn/kbd

Greenfield projects



Brownfield new train projects



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* NCI is calculated from the brownfield addition together with existing capacity
Source: Expert interviews, press articles, FACTS, team analysis

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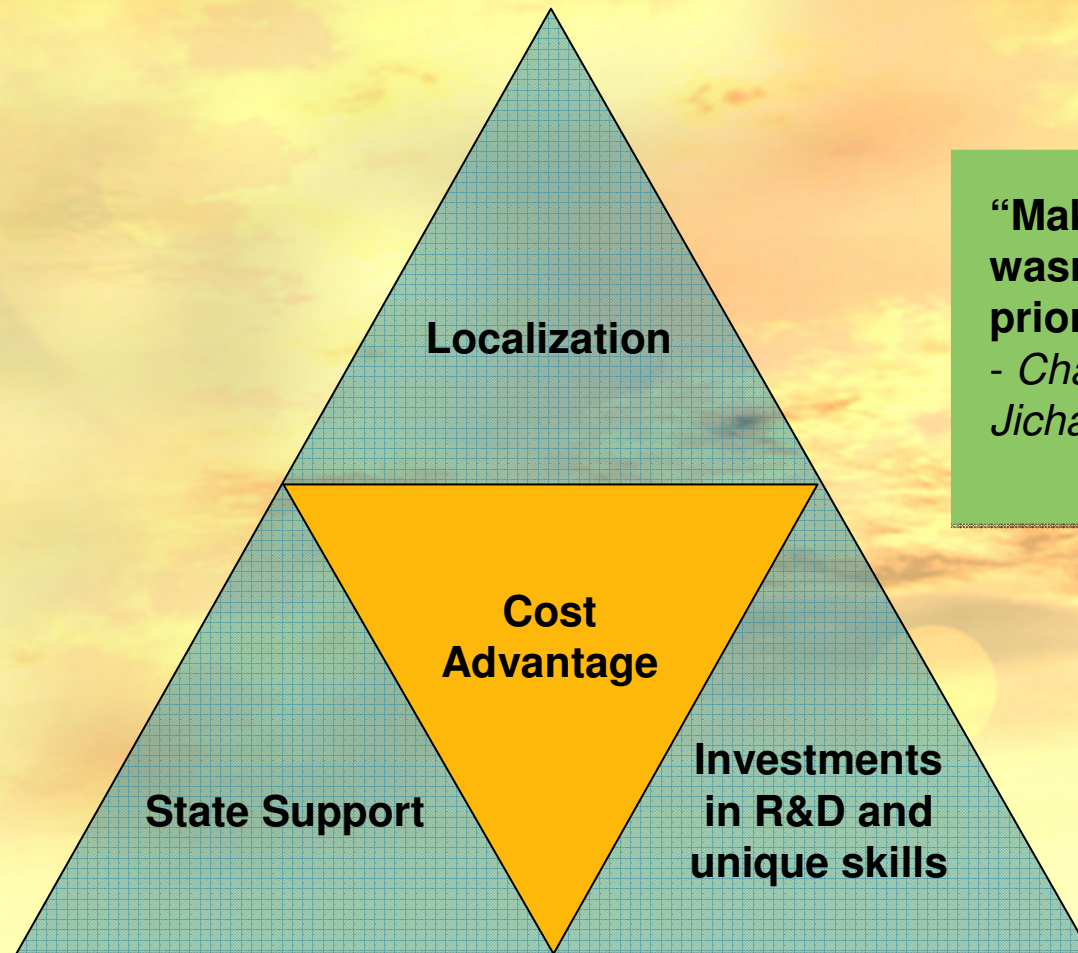


A few questions to gauge the room

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Shanghai Zhenhua value proposition for the San Francisco Bay Bridge Project



“Making money wasn’t the first priority for us”
- Chairman Zhou Jichang

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Source: Bloomberg; Factiva news articles; Interim report; Prospectus

Missteps by China Railway Group led to cancellation of the Polish Highway authority contract in 2007

CRG subsidiary underbids to enter European market, supported by China's Go-out policy

Polish Construction association files suit in WTO – unsuccessful

Increase in costs and restrictions on Chinese workers compress margins further

Polish authority cancels contract and demands compensation - losses exceed \$395 million

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China Metallurgical Group



- Established in 1982, listed in 2006
- \$30 billion in revenues; 120,000 employees
- Primarily metals oriented EPC, but also equipment manufacturing, real estate, and resource development
- International projects in Australia, Papua New Guinea, and Central Asia
- Keen focus on bringing technology expertise to international standards
- 10 subsidiary design and research institutes focused on enabling full EPC offering
- 3 - 5% net margin

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China Communications Construction Company Ltd.



- Resulted from merger of China Harbour Engineering Company and China Road and Bridge Company in 2005
- Listed in Hong Kong in 2006
- \$45 billion revenues; 110,000 employees
- Consists of 34 distinct subsidiaries; also 19 national design, technology, and research institutes
- Largest Chinese design and construction company of harbours, roads, bridges, and largest dredging company; world's largest manufacturer of container cranes

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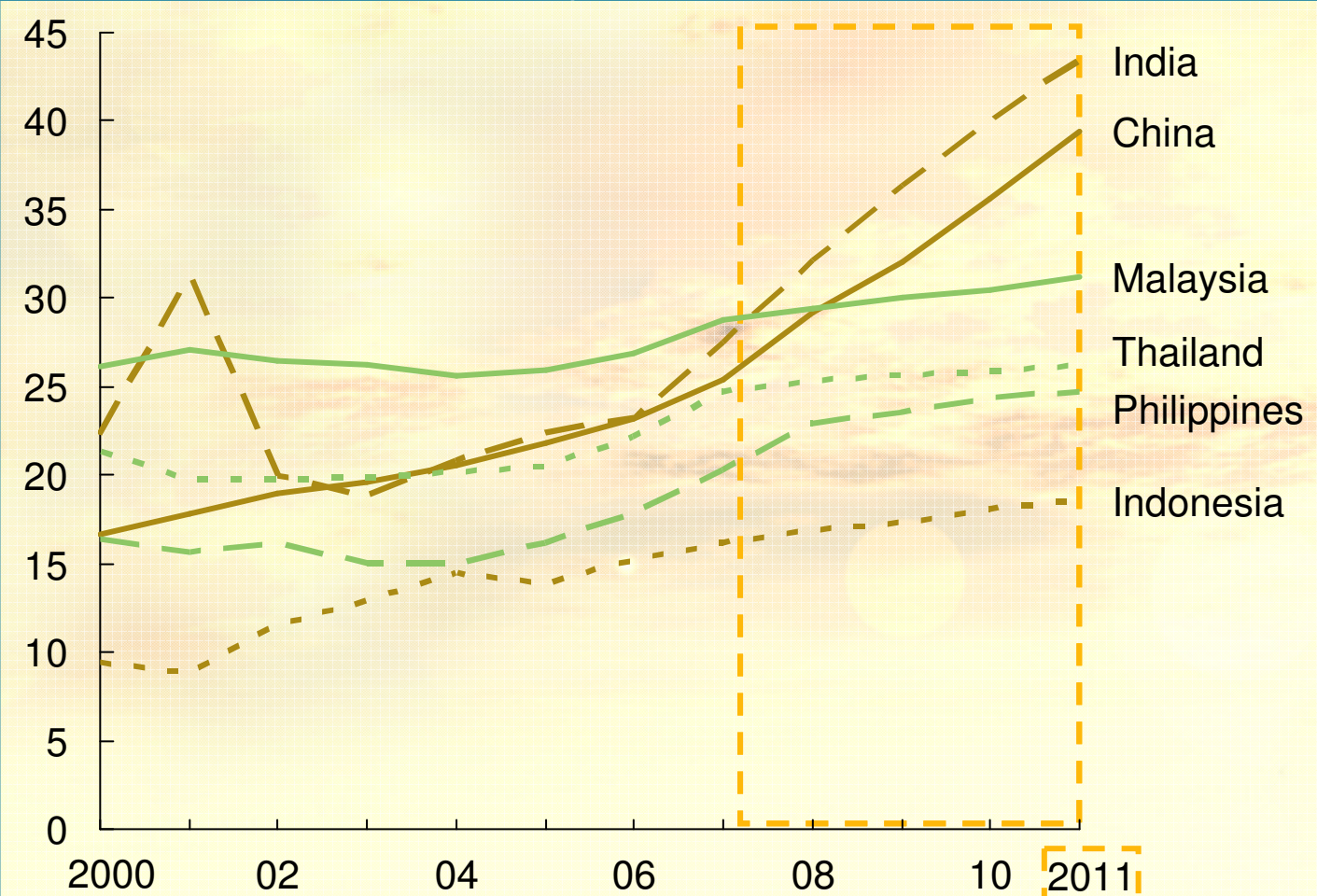
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Labour costs in China and India are still low ... but rising rapidly

FORECAST

Productivity-adjusted cost of labor

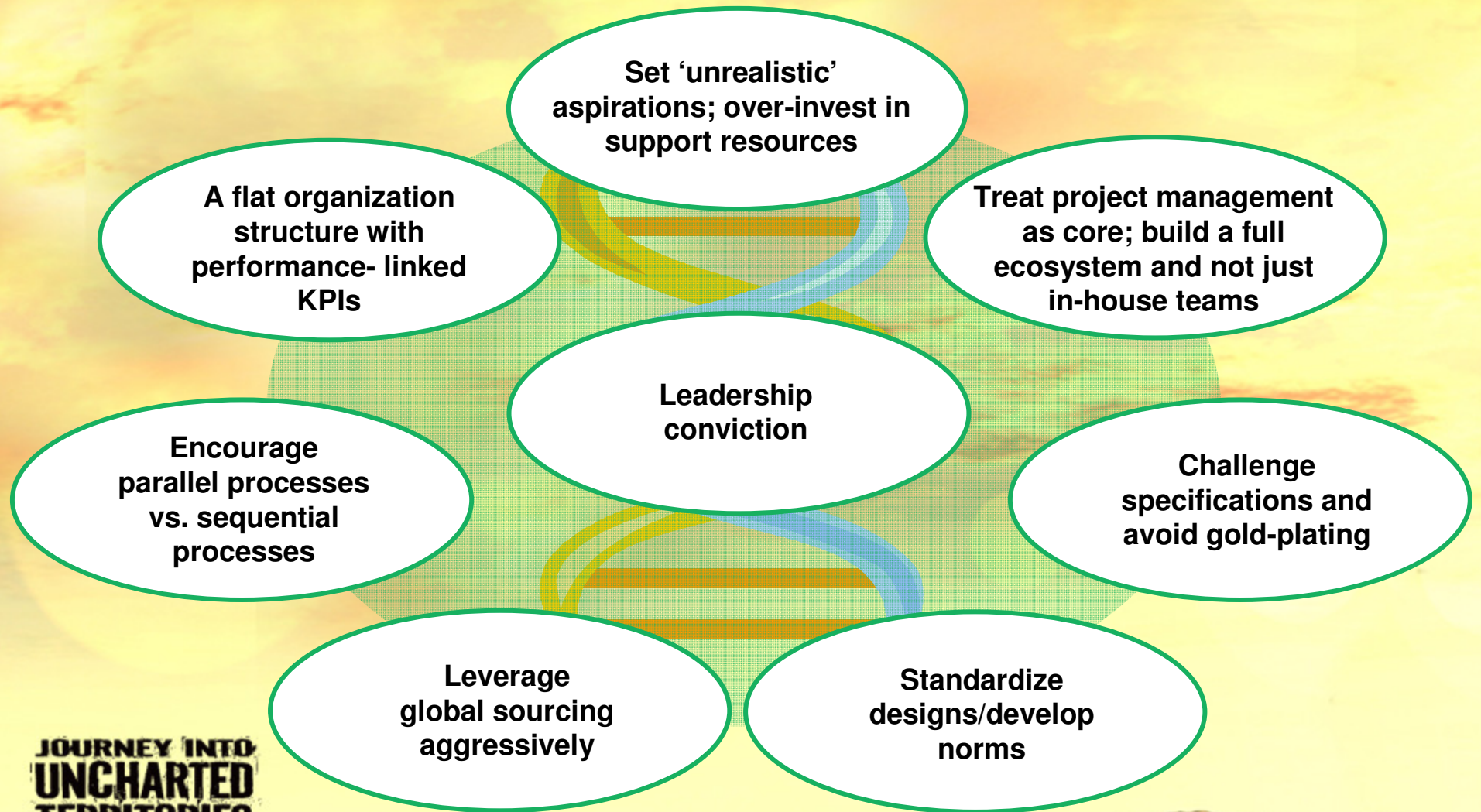
\$ cents of labor cost needed to produce \$1.00 of GDP



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Asian contractors share some unique characteristics and practices integral to their DNA



'Best-in-class' players set seemingly unrealistic aspirations

Aspiration	vs. Conventional wisdom	Outcome
Leading Asian power company <ul style="list-style-type: none">Build world-class power plant in 42 months	<ul style="list-style-type: none">A typical power plant of this size requires ~60 months for completionLimited experience	<ul style="list-style-type: none">Power plant project on track
Leading Asian metals company <ul style="list-style-type: none">Become lowest-cost metal X producer globallyIncrease metal X production capacity 10 times over 7 years	<ul style="list-style-type: none">Legacy public sector DNA with low emphasis on costNo company in that country had ever been among the top 10 metal X producers globally	<ul style="list-style-type: none">Reduced production cost by ~20% in 4 yearsOn track for targeted capacity expansion

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* Major oil company (MOC)
Sources: Company Red Herring Prospectus; Company websites; Press clippings

They are willing to over-invest in external manpower and other support resources

Characteristics

- Understand that support resources (people and equipment) form a relatively small part of overall project cost
- Encourage competition; smooth out interpersonal issues

Example

- A large Asian construction major
 - Mobilized more than 100,000 workers spread over 3 shifts at a site; 30 cranes used where only 10 required
 - Contracted multiple contractors (with separate teams) on 'fast-track' projects to expedite completion of different parts within tight deadlines
 - Utilized multiple external consultants to design separate parts of multi-complexes concurrently under common set of norms
- A large telecom major is not averse to appointing multiple teams to same task; risking and managing potential people issues

They strongly believe project management is core to operations

Characteristics

Example

Invest significantly in in-house project management capabilities

- Leading Asian conglomerate's massive team of over 7,500 techno-commercial engineers interconnected globally handles diverse range of projects – retail, telecom, petrochemicals, etc.

Reluctant to hand out complete end-to-end mega lump sum turn key (LSTK) contract

- Leading Asian NOC* plays the role of project integrator
 - Aggressive unitization, e.g., hydrocracker at latest refinery project auctioned to an EPCM company
 - Day-to-day management of engineering consultants done to expedite process

Strip all contracts into their time and motion elements

- Procurement is in-house at a leading Asian conglomerate; civil contractors are paid only for manpower supplied and material is issued freely by owner

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* National oil company (NOC)
Source: Interviews

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They avoid any gold-plating and are unwilling to leave any optimization lever untried

Phase of optimization	Optimization activities	
Design	<ul style="list-style-type: none">Holistic approach through: system balance, redundancy reduction, technology evaluation, benchmarking, supplier discovery	Issues spec
Bidding	<ul style="list-style-type: none">Leveraging suppliers extensively for spec evaluation; technology evaluation	Start evaluation
Bid evaluation	<ul style="list-style-type: none">Establish target and total cost of ownership (TCO) of packagesCreate a negotiation strategy to achieve target cost	Award contract
Execution	<ul style="list-style-type: none">Determine optimum execution methodsIdentify possibilities of modularization to reduce time and/or cost	Nevertheless, companies not averse to strategic pre-investment

They standardize designs and norms while building large or many projects

Single larger projects

Multiple projects with slightly different requirements

Approach

Asian power plant player

- Replicates similar designs for plants of same capacity
 - Build on prior experience

A leading Asian construction major

- Has standardized design inputs to consultants, apartment finishing norms, and equipment specification, e.g., parking area per car

Outcome

- Increased plant efficiency
- Lower capex costs

- Benefits from economies of scale

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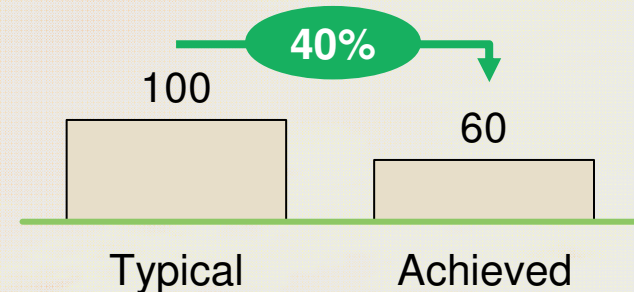
They contract major equipment through global sourcing to unlock substantial value

Characteristics

- Provide significant top-down push to leverage global sourcing
- Ensure global sourcing for cost and time advantage
- Look for engineering activities besides commodity equipment sourcing
- Consider new but promising vendors
- Make it worthwhile for vendor to succeed

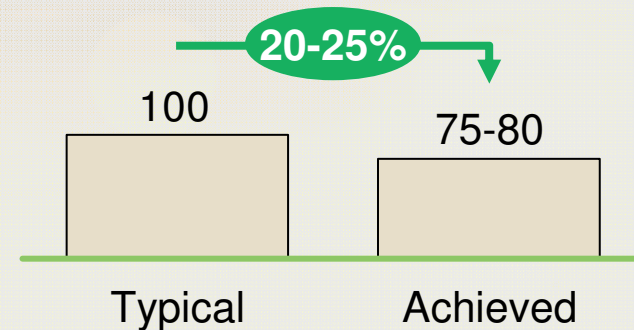
Impact

**Project cost:
leading Asian
metal
company
(indexed)**



**Construction time also
reduced by 4 months**

**Project cost:
leading Asian
NOC (indexed)**



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They implement flat and empowered project organization that improve execution speed

Minimize layers

- Maintain 2-3 layers between CEO and project executors

Staff key positions with credible managers

- Ensure project director (PD) has sufficient level of project managerial competence and is well respected
- Ensure each group head has significant domain experience; typically they should have handled similar-sized projects

Empower managers

- Make PD accountable for overall project outcome
- Do not question decisions unless budget is threatened

Provide full control to PMs over critical resources

- Give PD full control of all resources required to execute project, including support services
- Give complete authority to L2 – personnel in their control units

Provide 'fast-track' access to senior management

- Allow PD to escalate critical issues to 'people who matter'
- Maintain open-door policy for frequent interactions and to foster risk-free environment

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Emerging market contractors ...

Shenzhen c.a. 1970



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... are not to be underestimated!

Shenzhen c.a. 2010



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If you have any further questions please feel free to contact us

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Thank you!

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