Journey Into Uncharted Territories

How are owners, contractors and suppliers adapting to successfully execute projects and reposition their businesses in the ever evolving project environment?

September 7-10, 2011
JW Marriott Desert Ridge, Phoenix, AZ

Repositioning the Projects Business in a World with Changing Boundaries
Increased Trends Towards Using Local Resources

Zeina Alwan

Marketing & Strategic Planning
Fluor

REPOSITIONING THE PROJECTS BUSINESS IN A WORLD WITH CHANGING BOUNDARIES
Market Drivers

• Economic growth in China, India and surrounding emerging markets
• Middle class consumers are increasing their standard of living
  – Higher quality food products and consumer goods
  – Big ticket items: appliances, electronics, automobiles
• Squeezed manufacturing profit margins
• Formation of Local Economic Blocks/Zones which puts restriction on “Product Import” culture.
Growth of Middle Class Spending

The global middle-class wave

Global middle-class consumption will shift heavily toward China, India, and other Asian countries (excluding Japan) as the high-income countries see their share decrease.

Benefits of Manufacturing Locally

- Reduced Investment Cost (equipment and other components)
- Reduced Labor Cost (however, “competitive wage” advantage is declining)
- Reduced manufacturing cost
  - Simplified logistics
  - Minimizing customs and import duties
- Improved customer service
Typical Execution Model in the Past

• Front End Engineering and Design (FEED) performed in western countries
• Localization of FEED in-country (time consuming and expensive)
• EPC or EPCM in-country
  – Heavy use of expats for oversight
• Cost prohibitive
• Not sustainable
Current State

- Regional contractors have increased expertise to meet Client needs
  - FEED and EPC/EPCM with minimal western support
- Clients establishing regional operation centers and moving their leadership to the emerging markets
  - Staffing is primarily local with minimal expats
  - Reliance on regional contractors for FEED and EPC/EPCM service
- Local Partnerships between IEC’s and CEC’s
- International contractors regional offices
  - More skilled local talent with fewer expats
- Clients, regional contractors, and international contractors competing for talent with similar skills
Impact to Contractors

- Local leadership essential for projects of all sizes
- Methods for developing local leaders
  - High potential employees
    - Stretch assignments
    - Boot camps
    - Western assignments for establishing network and training to western standards
- Challenges
  - Achieving low overall efforthour cost ($/hr)
  - Supporting client project cost and schedule goals without compromising safety and quality
  - Retention
  - Rapid training of locals in best practices, processes, procedures and use of the state of the art technologies to manage projects
Client Staffing Models

- Clients forming long-term alliances with multiple contractors
  - Allows clients to have a slim management team
  - Reliance on contractors to provide the best resources for projects
  - Win-win for both parties
- Clients establishing a large operation in developing countries
  - Contractor alliances to provide seconded staff
  - Client self performs projects
  - Busy contractors are reluctant to second employees
  - Requires a large client organization to manage all aspects of EPC/EPCM execution
  - Not as cost effective or sustainable
Contractor Execution Strategies (PDP/FEED/Engineering)

• Forming consortiums or partnerships with competitors
  – Sharing of the talent pool
  – Project sizes can dictate partnering to bid and execute projects
  – Not unusual for a large international contractor to become a subcontractor to another international contractor

• Distributed Execution
  – Limited scope (PDP) in western offices
  – Majority of engineering (including FEED) executed in an office located near the client’s project site
  – Leverages electronic tools and state of the art technologies
  – Win-Win for clients and contractors
Execution Strategies for Procurement

- Client and contractors are maximizing local content for engineering/design and material management
  - Use of Industry Standard Specifications instead of expensive Client specifications, in most cases
  - Reduces capital cost and lead time for equipment and materials
  - Early involvement of local suppliers to standardize components
  - Key supplier Strategic Supplier Relationship Agreements (SRAs) to support advancing project schedules
  - Use of local SRAs for standardization supports operations and maintenance of the completed facility
Execution Strategies for Construction

• Client and contractors are maximizing local content for managing construction
  – Use of qualified General Construction Contractor(s), GCC’s, who can build from foundations all the way through Mechanical Completion
  – Utilization of a 100% local construction management team (ease of communication and knowledge of local codes and standards and permitting and authority approval requirements)
  – Use of well established construction strategy involving use of multiple GCC’s with vertical scope split to minimize interfaces and reduce the CM staff
  – Oversight on all aspects of construction steps including safety, quality, and construction supervision
  – Use of Masterpiece program to ensure quality of construction
Execution Strategies for Construction (Contd.)

- Use of a comprehensive Material Responsibility Matrix (MRM)
- Establishment and implementation of a HSE and QA/QC plan
- Use of construction work packages to manage construction effectively from engineering through procurement and through construction
- A well established testing and turnover plan to deliver facility by systems and in accordance with the commissioning and start-up sequence
- Project closeout plan including completion of as-built documentation
Moving into the Future

- World population will reach 10 billion
- Developing countries representing >2/3 of the world’s middle class consumption will demand a better standard of living
- China will become world’s leader in patents (innovation) and “Created in China” will replace “Made in China”
China Patent Boom

Drivers behind China’s patent boom:
- Innovations by domestic entities
- Increasing overseas invention patent applications
- Fast growing patent applications in high-tech fields
- Government Incentives and Investment in R&D.

In 2011 China will surpass Japan and US in total patent volume.

CAGR (2009-2014)
- China: 26.1%
- US: 4.8%
- Japan: 4%
- Europe: 5.5%
- Korea: 1%
Moving into the Future (Contd.)

- Manufacturers will move operations in close proximity to consumers
  - Clients establish local operations
  - Contractors establish local EPC/EPCM platform
  - Cost effective execution to support schedule

- Clients and contractors compete for resources in an open market
Successful Mitigation of the Resource Issue

• Alliance and partnering strategies
  – Clients and contractors
  – Competing contractors
  – Create win-win solutions

• Technology
  – Leverage state of the art technologies
  – Distributed execution
  – Move work not people
LDK Project Example - Partnership at its Best

- LDK Polysilicon Project: Fast Track, China Execution, $1.5 Billion TIC; from FEED to first product in 24 months

- Key Execution Strategies
  - Execution Driven by EPCM contractor
  - Slim Client organization
  - Design/Build Approach & Engineering Driven by Construction Sequencing from Day 1
  - Use of PEPCI process for material management
  - Maximization of onshore equipment and materials
  - Use of Teaming Construction Contractors
  - Pre-commissioning and Commissioning Support
LDK Project Example - Partnership at its Best

- LDK Google Earth - January 2007
- LDK Google Earth - October 2009
LDK Project Example - Partnership at its Best
LDK Project Example - Partnership at its Best

• Aligned approach to fast track (24month) schedule, without compromising HSE/quality/operational performance and project cost
  • Highly experienced team
  • Use of past experience from a smaller polysilicon project
  • Purchase of all long-lead items during first 30 days
  • Selection of CDI’s, CCC’s within first 30 days
  • Incorporate strategies to manage
    • Lowest cost
    • Fast track schedule
  • Site mobilization within first 30 days and start of site preparation and underground works
  • Development and incorporation of technologies for WWT and Vent Treatment during execution
  • Highly instrumented and automated closed loop plant