THAILAND STEEL INDUSTRY OUTLOOK

Demands and the Number of Railway Projects

Ditsapol Padungkul
Outline

• Introduction

• Growing Domestic Demand

• Steel Business opportunities from electric train projects in Bangkok and vicinities

• Steel Business opportunities from double-track projects
Strong Business Climate

• World Bank Doing Business 2015 reported Thailand was ranked 26th in the world and 5rd in East Asia and the Pacific in terms of ease of doing business.
Growing Domestic Demand

- Automotive industry
  - Thailand is Southeast Asia’s largest vehicle producer and world’s largest manufacturer of one-ton pick-up trucks
  - In 2014, Thailand was the world’s 12th largest automobile manufacturing country
  - Vehicle production volume in 2014 reached 1.88 million units, an 88% increase from 2009
Growing Domestic Demand

- Electronics and electrical appliances industry
  - Thailand is a world leading computer data storage unit manufacturing base, boasting the 2nd highest export value in the world after China
  - Thailand is also the world’s second largest producers of air conditioning units
  - The market growth of small electronic appliances in the middle of 2015 in Thailand was estimated to be approximately 5%
Growing Domestic Demand

- Food processing industry
  - Thailand is one of the world’s largest producers of food products such as rice, canned tuna, sugar cane, frozen seafood, chicken and canned pineapple product
  - In 2014, Thailand ranks 2nd in the world for net export for sugars, 9th for vegetables and 16th for seafood
  - Food consumption expenditure in Thailand increased by 3.8% in 2014
Growing Domestic Demand

• Construction industry
  • Thailand’s government budget for public investments in 2016 includes up to US$4.16 billion planned for expanding roads, mass transit and water management systems
  • The two main mass transit systems in Thailand are the Mass Rapid Transit (MRT) and the Bangkok Mass Transit System (BTS)
Growing Domestic Demand

• Construction industry (cont’d)
  • The construction industry in Thailand is forecasted to grow in 2016 mainly due to government investment in the industry which has increased by 74% and investments by state enterprise increasing by 30%
Growing Domestic Demand

• Construction industry (cont’d)

• The government is currently implementing an 8 year (2015-2022) infrastructure investment plan, with a budget of around US$75 billion, which aims to significantly expand and improve the country’s railway, road, mass transit, water and air transport.
Business opportunities from electric train projects in Bangkok and vicinities

• At present, only 537 square kilometers of Bangkok, or one-third of the city area, is served by the mass transit systems.

• Thus, the government is trying to push the development of mass rapid transit projects to provide more complete service, which will in turn generate greater economic and social benefits.
Business opportunities from electric train projects in Bangkok and vicinities

- The construction of the four new mass rapid transit lines (Green, Orange, Pink and Yellow) in Bangkok will benefit construction contractors and construction materials companies by as much as 150 billion baht

- As predicted, a minimum of 280,000 tons of steel worth 5.6 billion baht, will be used in construction of the four lines
Business opportunities from electric train projects in Bangkok and vicinities

• When operators later expand and upgrade service, then local producers of machinery and parts can start supplying these parts***

• Producers should begin with basic parts such as windows, seats, handrails, electric cables or air conditioning

• Gradually move into more sophisticated technology, such as electrical systems and rail-signaling systems, as well as assembly of imported train parts
<table>
<thead>
<tr>
<th>Project</th>
<th>Dist. (km)</th>
<th>Budget Mil.THB</th>
<th>Status</th>
<th>Open Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kaerai-Minburi</td>
<td>34.5</td>
<td>56,691</td>
<td>-Cabinet approval -PPP Fast Track</td>
<td>2020</td>
</tr>
<tr>
<td>2. Cultural Center-Meenburi</td>
<td>21.5</td>
<td>110,117</td>
<td>Approved by the cabinet for Civil Works (start 16 March 2016) - E&amp;M &gt;&gt; PPP Fast Track</td>
<td>2020</td>
</tr>
<tr>
<td>3. Ladprao-Samrong</td>
<td>30.4</td>
<td>54,644</td>
<td>-Cabinet approval -PPP Fast Track</td>
<td>2020</td>
</tr>
<tr>
<td>4. Bangsue-Huamark</td>
<td>19</td>
<td>44,158</td>
<td>To be submitted to the cabinet approval</td>
<td>2020</td>
</tr>
<tr>
<td>5. Rangsit-Thammasat</td>
<td>10</td>
<td>6,028</td>
<td>-Under SRT revision to be in line with Bangsue-Rangsit Section (from 3 – 4 tracks)</td>
<td>2020</td>
</tr>
<tr>
<td>6. ARL Extension</td>
<td>21.8</td>
<td>31,139</td>
<td>-Under SRT revision to be in line with Bangsue-Rangsit Section (from 3 – 4 tracks)</td>
<td>2021</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>143.7</td>
<td>302,777</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Business opportunities from electric train projects in Bangkok and vicinities

Value of investment in the four new transit lines that will begin construction in the medium term

Unit: billion baht

<table>
<thead>
<tr>
<th>Line</th>
<th>Consultant</th>
<th>Land Acquisition</th>
<th>Tracks and Rolling Stock</th>
<th>Civil Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Line</td>
<td>53</td>
<td>15</td>
<td>8</td>
<td>87</td>
</tr>
<tr>
<td>Orange Line</td>
<td>110</td>
<td>10</td>
<td>15</td>
<td>83</td>
</tr>
<tr>
<td>Pink Line</td>
<td>57</td>
<td>8</td>
<td>7</td>
<td>42</td>
</tr>
<tr>
<td>Yellow Line</td>
<td>55</td>
<td>8</td>
<td>6</td>
<td>41</td>
</tr>
</tbody>
</table>

(Mo Chit-Saphan Mai-Ku Khoi) (Cultural Center-Minburi) (Khao Rai-Minburi) (Laciprao-Samrong)
Business opportunities from electric train projects in Bangkok and vicinities

Value of construction material expected to be used in the construction of the 4 mass transit lines

<table>
<thead>
<tr>
<th>Year</th>
<th>Cement</th>
<th>Structural Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016F</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>2017F</td>
<td>0.3</td>
<td>0.9</td>
</tr>
<tr>
<td>2018F</td>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>2019F</td>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>2020F</td>
<td>0.2</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Unit: million baht
Business opportunities from double-track projects

• Total investment budget for the three double-track railways are about 55 billion baht with an expected annual investment of 10 billion baht between 2017-2019

• The main materials used to lay the new track are cement railroad ties (also known as railway sleepers) and steel rails

• Expecting the initial phase of the three railways to use 45,000 tons of steel rail (worth 1,660 million baht)
Track Doubling Projects: (Construction in 2015-2022)

Track Doubling (Phase I & II) (8 yrs.)

<table>
<thead>
<tr>
<th>Network</th>
<th>Distance (km.)</th>
<th>Existing</th>
<th>Double Track (Phase I &amp; II) (8 yrs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Track</td>
<td>3,685</td>
<td>1,156</td>
<td>1,156 (28.6%)</td>
</tr>
<tr>
<td></td>
<td>(91.1%)</td>
<td>(28.6%)</td>
<td></td>
</tr>
<tr>
<td>Double Track</td>
<td>251</td>
<td>2,780</td>
<td>2,780 (68.7%)</td>
</tr>
<tr>
<td></td>
<td>(6.2%)</td>
<td>(68.7%)</td>
<td></td>
</tr>
<tr>
<td>Triple Track</td>
<td>107</td>
<td>107</td>
<td>107 (2.7%)</td>
</tr>
<tr>
<td></td>
<td>(2.7%)</td>
<td>(2.7%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4,043</td>
<td>4,043</td>
<td></td>
</tr>
</tbody>
</table>

- Single Track
- Double Track
- Triple Track

- Single Track
- Double Track
- Triple Track
<table>
<thead>
<tr>
<th>Projects</th>
<th>Cost mil.THB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project in Progress</strong></td>
<td></td>
</tr>
<tr>
<td>1. Cha Cheng Sao - Kang Koi (106 km.)</td>
<td>11,272</td>
</tr>
<tr>
<td>2. Jira-Khon Kaen (187 km.)</td>
<td>26,005</td>
</tr>
<tr>
<td><strong>Budget approval</strong></td>
<td></td>
</tr>
<tr>
<td>3. Prachuab-Chumporn (167 km.)</td>
<td>17,291</td>
</tr>
<tr>
<td>4. Lopburi-Pak Nam Pho (148 km.)</td>
<td>24,940</td>
</tr>
<tr>
<td>5. MabKaBao-Jira (132 km.)</td>
<td>29,853</td>
</tr>
<tr>
<td>6. Hua Hin-Prachuab (232 km.)</td>
<td>26,532</td>
</tr>
<tr>
<td>7. Nakhon Pathom-Hua Hin (165 km.)</td>
<td>20,145</td>
</tr>
<tr>
<td><strong>Total (905 km.)</strong></td>
<td>~15x,xxx</td>
</tr>
</tbody>
</table>
Business opportunities from double-track projects

• As for steel rails, Thailand will have to rely on imports for the first three projects

• However, if more railway projects happen in the future, Thai steel entrepreneurs should not overlook this opportunity
Business opportunities from double-track projects

Breakdown of investment in double-track railways likely to commence by 2019.

Unit: million baht

<table>
<thead>
<tr>
<th>Project</th>
<th>Consulting fee, land</th>
<th>Signaling system</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chachoengsao-Klong 19-Kaeng Koi</td>
<td>1,599</td>
<td>9,255</td>
<td>10,854</td>
</tr>
<tr>
<td>Chira-Nakhon Ratchasima-Khon Kaen</td>
<td>1,629</td>
<td>3,573</td>
<td>26,556</td>
</tr>
<tr>
<td>Prachuab Khiri Kan-Chumphon</td>
<td>276</td>
<td>3,403</td>
<td>17,293</td>
</tr>
</tbody>
</table>
Business opportunities from double-track projects

Unit: million baht

The costs of main construction materials for the three double track railways
Railway systems

- **Electrification**
- **Station & Civil work**
- **Rolling stock**
- **Trackwork**
- **Signalling & Communication**
Metal in Rolling stock

- Air conditioner housing
- Body frame and panel
- Equipment box
- Suspension (spring & damper)
- Bogie
- Wheel set (wheel / axle bearing)
Metal in freight Bogie
Metal in power supply

Overhead Catenary System (OCS)

Third Rail System

3rd rail & rail support devices
Railway Technology and Industry Development

Thailand railway expert development center

Railway engineering course participants (batch 1-6)

Universities & Research institute

Government

Operator

Industries

TREA

199 members from 4 railway related sectors
Sustainable in railway development

TREA & THAI RAILWAY TECHNOLOGY INSTITUTE:

Improve the whole railway industry

Stakeholders
- Customer
- Suppliers
- Policy maker
- Public (media, scholars etc.)
- Employee

Guiding star

Core purpose
to deliver the modern public transport serving with convenience, promptness, and safety for both passengers and freights

Core value
sufficiency and sustainability

Networks
Question: ditsapol@trea.or.th ; ditsapon@yahoo.com