Managing Innovation and Technology of SCG, A Case Study

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SCG Factsheet

- Founded in 1913 by King Rama VI, and listed on the Stock Exchange of Thailand since 1976.
- Major shareholder: The Crown Property Bureau
- Business Units in SCG: Cement, Chemicals, Paper, Building Materials, Distribution, and Investment
- Companies: Over 120
- In 2009, Total net sales: $7.2 Billion
- Total employees: 28,568
Evolution of Business Strategies

1913 - 1970
- Organic Growth in construction material industries
- "Historic roots"
  - Cement
  - Construction Materials
  - Steel

1970's - 1980's
- Take over of "ailing" industries
- "Opportunistic investment in assets"
  - Cement
  - Construction Materials
  - Steel
  - Ceramics
  - Paper & Packaging

1980's - 1990's
- Entry into new industries
- "Joint venture partner of choice"
  - Cement
  - Construction Materials
  - Steel
  - Ceramics
  - Paper & Packaging

1998 - 2003
- Concentration on Competitive Platforms
- After the crisis "Restructure Business Unit"
  - Cement
  - Construction Materials
  - Steel
  - Petrochemicals
  - Automotive
  - Electrical

2004 - Onwards
- Regional Moves & Innovation
- High Value Added products and services
  - Cement
  - Construction Materials
  - Steel
  - Petrochemicals
  - Automotive
  - Electrical
SCG’s Vision
Our People… Drawing the Future

By the year 2015, SCG will be well recognized as an *innovative workplace of choice*, and a *role model in corporate governance and sustainable development*.

We see SCG as a *regional market leader*, contributing to the sustainable progress of ASEAN, and the local communities where SCG operates.

SCG Competitive Landscape

The old playing field
- **Territory**: Domestic
- **Product**: Commodity-based
- **Focus**: Cost leadership

The new playing field
- **Territory**: ASEAN
- **Product**: High Value Added products/services
- **Focus**: *Technology, Green Initiative, Brand*
• Increase customer satisfaction
• Differentiate from the competitors
• Compete on Value to Customers, not price

Innovation through R&D helps us transform commodities to unique high value added products and services

HVA Contributed almost 30% of SCG total sales in Q1, 2010

Note: Including associates
R&D Expenditure 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>R&amp;D Expenditure as % of GDP (2007)</th>
<th>% of R&amp;D Expenditure contributed by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Public</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.24</td>
<td>57%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.63</td>
<td>28%</td>
</tr>
<tr>
<td>China</td>
<td>1.34</td>
<td>33%</td>
</tr>
<tr>
<td>Singapore</td>
<td>2.36</td>
<td>36%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>2.52</td>
<td>35%</td>
</tr>
<tr>
<td>Korea</td>
<td>2.99</td>
<td>23%</td>
</tr>
<tr>
<td>Japan</td>
<td>3.33</td>
<td>24%</td>
</tr>
<tr>
<td>Finland</td>
<td>3.48</td>
<td>29%</td>
</tr>
</tbody>
</table>

Source: 1. OECD, Main Science and Technology Indicators, May 2007
         2. Malaysia Science and Technology Information Center (MASTIC)
         3. NRCT & NSTDA

How to create effective HVA products

- Exchange program of R&D personnel from public to private sector to understand need of private sector and gain field experience

Most of R&D personnel in Thailand are still in Non-Business segment

Source: IMD
SCG Innovation

Create value to our customers, employees, partners, and shareholders

Focus on both incremental improvement and breakthrough of products, process, and business model

Enhance creativity by inducing Inno-Culture & Atmosphere

Clear Business Direction and Leadership

Inno-Culture
- Open mind
- Think out of the box
- Assertive
- Risk taking
- Eager to learn

Continuous Improvement

Human Resource

R&D

Our own technology

Own IP (Intellectual Property)

High Value Added Products and Services

Effective R&D and Technology Management
Innovation Management System

**R&D**
- R&D Project Management
- Portfolio Management
- Resource Allocation
- Human Resource Management

**Collaboration**
- Open Innovation
- Fit & Strategic Partners
- Community of Practice

**IP**
- IP Creation
- IP Protection
- IP Commercialization

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**Capability Development**

*By 2015… with the full involvement of our people about 50% of our revenues will come from HVA*

**R&D for HVA Staff**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>364</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>882</td>
<td>142%</td>
</tr>
</tbody>
</table>

**Our People**
- R&D for HVA Staff
  - 2010: 882 persons (PhD 40 persons)
  - 2007: 364 persons (PhD 9 persons)

**Recruitment**
- Project Based Recruitment
- Innovative Organization Brand
- PhD Internship
- Networks and Collaboration with leading Universities

**Development**
- Technical Mentoring program
- Development Program for R&D Staff
SCG Technology Management

Objectives:
- Create capability to develop own technology & IP
- Promote visibility & critical mass of R&D career
- Encourage synergy among business units

Structure:
- R&D Centers at business units
- Corporate Technology Office (CTech) at SCG Headquarter
- Technology Management Committee

System: Alignment between business strategy

SCG R&D and Technology Scheme

Business R&D
- Product Line Extension
- Short, medium and long term business R&D

Suppliers

Customers

Pulp/Paper/Packaging

Cement

Building Materials

Chemical

Distribution

Universities/Research Institutes

Government

RD&T Director

Tech. Mgmt. Committee

Corr. Tech. Director

Corporate Technology Office
- Strategic R&D Mgt
- Cross BU Tech. Roadmap
- Strategic IP Mgt
- Alliance Development
- New Technology/ Business
Thailand & Global Collaboration with Universities and Research Institutes

- **No. of Universities and Institutes**
  - Domestic: 13
  - International: 18
  - e.g. Georgia Tech., MIT, U of Tokyo, Tokyo Inst. Tech., NSTDA,

- **Activities e.g.**
  - Collaborative R&D projects
  - SCG scholarships for various universities in Thailand
  - Industrial/ Business internship
  - Researcher exchange and training program

Inno-Products and Inno-Awards
SCG Chemicals

- SCG Chemicals developed PE 100+ Pipe, flexible & no rust pipe – *The first in ASEAN and the second in Asia*

SCG Cement

- Tiger Mortar: Color render cement
SCG Cement

- Agricultural Drying Yard Concrete (CPAC)
- An innovation product to accelerate drying of agricultural products on concrete floor
- Shorten drying period of agro-products

SCG Building Materials

- Smart wood: Wood substitute products
SCG HEIM: Home Technology for Superior Quality of Living

- Own SCG HEIM House within 3-4 months
- Low Life Cycle Cost e.g. utility cost, maintenance

Superior Technology Only at SCG HEIM
- Modular system
- Air tightness system
- Insulated Double – Glazing for windows
- New exterior wall
- Air factory system

The 3Cs Concept for Better Living:
- Concept
- Confidence
- Convenience

SCG Paper

Innovative Printing & Writing Paper
- The First Innovative, Environmental Friendly Printing and Writing Paper
- With Eco Fiber, Idea Green reduces the usage of Tree by 30%
- Idea Green received MATT Award by Marketing Association of Thailand in November 2008

- Idea Work, Super Premium Quality Office Paper with New Matrix Fiber Structure and Nano Coating Formula
**SCG Paper: Eucalyptus**

New hybrid-strain development **achieved in 5 years** (normally 11 years)

Properties:
- Resist to plant disease, arid climate
- Suitable for plantation on hard soil
- Fast growing with higher yield
- High wood content for pulp production

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**SCG Experience: SCG Flagship Store**

- In-dept & Inspiring People
- Efficient & Innovative Process
- Inspiring Physical Environment
Green Initiative is a key trend in the world

SCG eco value

- eco = Ecology + Economy
  Balance and Sustainable relationship of economy, society and ecology
- value
  Value for stakeholders, society and environment received from innovative products and services

Cool Roof System
Activ-Flow: Reduce energy in formation process
Green Read: Eye-cared Paper
Elephant Cement: Corrosion Resistance

> 80 products with sales of 34,000 Million Baht (14% of total sales)
SCG eco value

Green Logistic by SCG
Reduce Green House Gas and fuel consumption by 3%/Transportation ton

Text Pro Creamy (for textbook printing):
Low weight and low light reflection for long reading, and lower CO₂ from production process

Exhibition (from Corrugated Containers):
Furniture for exhibition, e.g. shelf and podium

SCG eco value

Sound Insulation
The product contains recycled contents greater than 70% by weight (100% natural sand substitution)

Heat Insulation
In addition to saving energy, the product contains recycled contents greater than 80% by weight (100% natural sand substitution)
Summary

• Alignment between business and technology strategy is important.
• A company without R&D will hardly survive in the future.
• Smart R&D project give rise to innovation.
• Company’s R&D will not be sustained without external science and technology collaboration (University and Research Institutes).
• Government must play a vital role in nurturing R&D activities in the country.

From SCG Experience

“R&D is a source of competitive advantage, wealth, and growth of SCG... and will be a solid foundation for future economic growth of Thailand and ASEAN.”

Kan Trakulhoon
Thank you