Downstream collaboration between steel industry and value chain

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WHO ARE SAINT-GOBAIN TODAY

Innovative Materials

Construction Products

Building Distribution

Norton

ISOVER

Gyproc

PAM

ADFORS

Jewson

GLASSOLUTIONS

WEBER

SEKURIT

Ecophon

POINT P

La Plateforme

OPTIMERA

GYPSUM AND CEILINGS ACTIVITY
GYPSUM ACTIVITY

Plasterboard and drywall systems
Building Plasters
Industrial plasters

Gypsum Ceilings

GYPSUM AND CEILINGS ACTIVITY
KEY FIGURES FOR SAINT-GOBAIN GYPSUM ACTIVITY

- **135** sites
- **75** quarries
- **56** countries
- **12,300** employees
- **€ 5.9 bn** sales*
- **44** training centers

*for Saint-Gobain interior solutions, which includes the gypsum activity
OUR PRESENCE WORLDWIDE
PRODUCTION FACILITIES IN 56 COUNTRIES
SAINT GOBAIN GYPSUM OBJECTIVES

Increase category penetration

Increase category value

Grow the pie
TRENDS IMPACTING ON CONSTRUCTION
URBANISATION KEEPS ACCELERATING EVERYWHERE

View from 40th floor of 117 floor apartment block in Mumbai

PERCENT OF POPULATION LIVING IN URBAN AREAS

WORLD

2014
2050

USA 81 87
FRANCE 79 86
GERMANY 75 83
CHINA 64 76
INDIA 32 50
BRAZIL 85 91
AFRICA 4 5

SAINT-GOBAIN
CONTRIBUTING TO CLIMATE CHANGE AND RESOURCE SCARCITY

CLIMATE CHANGE
+2°C by 2100 (COP 21)

CLIMATE REFUGEES
60 million in 2015, 250 million by 2050

AIR POLLUTION
> 7 million deaths in the world in 2015

RAW MATERIALS DEMAND
+ 50% by 2030, with some raw materials disappearing by 2100

WATER DEMAND
+40% by 2030

ENERGY DEMAND
+40% by 2030
CONSTRUCTION EFFICIENCY AND PRODUCTIVITY

10

The productivity opportunity in construction

Construction matters for the world economy but has a long record of poor productivity. Construction-related spending accounts for 13% of the world’s GDP, but the sector’s annual productivity growth has only increased 1% over the past 30 years. $1.6 trillion of additional value added could be created through higher productivity, meeting half the world’s infrastructure need.

Construction is a sector of two halves. Fragmented specialized trades drag down the productivity of the sector as a whole.

Action in seven areas can boost sector productivity by 50–60%.

5–10X productivity boost possible for some parts of the industry by moving to a manufacturing-style production system.

McKinsey Global Institute

McKinsey & Company

CONSTRUCTION EFFICIENCY AND PRODUCTIVITY

Productivity, 2012
3 thousand per person employed, 2015

3

Housing for-sale builders

Commercial and Institutional

Automobile manufacturing

Heavy Industrial

Oil and gas pipeline

Industrial

Electrical

Water and sewer

Power and communications

Multifamily housing

Highway, street, bridge

Site preparation

Plumbing, HVAC

Single-family housing

Electrical

Drywall

Framing

Painting

Flooring

Residential remodeling

Painting

Roofing

Small trades

Heavy construction

Productivity compound annual growth rate, 2002-12
Annual growth in real gross value added per person employed, %

1. Manufacturing plants and warehouses.
2. All subsectors deflated with overall construction sector deflator, not subsector-specific prices.


GYPSUM AND CEILINGS ACTIVITY
OFFSITE, STEEL FRAMED BUILDINGS

Offsite construction

Steel framed buildings and penalisation
COMPETING MATERIALS
CONCRETE AND MASONRY

- Dominates in most markets
- Traditional material with established supply and installation base
- Seen as permanent solid and secure
Increasing market as technology develops to build higher
- Good sustainability message
- Geographical constraints?
WHY COLLABORATE
Individually – we are just making a sales pitch

- Use steel framing
- Use Drywall systems
WHY COLLABORATE
Collectively – it’s inspiration for change

Increase the credibility of our message and reach more influencers and decision makers

Do you know about the benefits of LGSF?
Why collaborate – part 2
What's the difference between this…
And this...
Plant Ecosystem

Interdependent Relationships

1. **Sun**
   Plants need sunlight to produce and make their own food.

2. **Water**
   Plants need water to grow.

3. **Wind**
   The wind carries plant seeds to create new plants.

4. **Animals**
   Animals help transfer plant seeds to create new plants.

NGSS/LS2.A-Interdependent Relationships in Ecosystems
Collaboration means we can put in place the right Ecosystem to support LGSF development.
LGSF – ECOSYSTEM

The “Big stuff” is critical
✓ Design capability
✓ Labour force
✓ Regulations
✓ Manufacturing and supply base

But don’t forget the “Small stuff”
✓ All the components to make the system work
✓ Accessories that make the building work
Examples of collaboration
DOWNSTREAM COLLABORATION EFFORTS – EXAMPLE 1
DOWNSTREAM COLLABORATION EFFORTS

Saint-Gobain and Tata joint collaboration
- Off-site modular manufacturing expertise
- Conventional look and feel
- Robust board solutions including premium options
- Multi-comfort approach for well-being of occupants
- Conform to International standards/regulations
- Single source with technical backup
- Use combined distributor and dealer network to promote jointly across India
DEMONSTRATING BENEFITS OF LGSF – EXAMPLE 2

- Saint Gobain project with Gleeds and Arup
- Re-design and re-plan 2 buildings in India
  - Hotel and Residential
- Demonstrated
  - average 4% project Capex cost saving
  - 4 months reduction in build time
Comparative study of LSF – Hot-rolled steel – Reinforced concrete and Timber Structural solutions

A collaborative project
INTRODUCTION

“THE ROLE OF STEEL IN SPURRING PRODUCTIVITY IMPROVEMENTS IN CONSTRUCTION”

❖ Benchmark studies comparing different structural solutions:
  - Light Steel Framing solution – Reference case study – FORCATECH Building – A, Luanda, Angola;
  - Hot-rolled steel;
  - Reinforced Concrete;
  - Timber.

Modified to match European requirements.
INTRODUCTION

“THE ROLE OF STEEL IN SPURRING PRODUCTIVITY IMPROVEMENTS IN CONSTRUCTION”

❖ Objectives:

▪ Compare different structural systems comprising different structural materials, for the same architectural layout, designed according to the Eurocodes;

▪ Understand strong and weak points of steel and other structural materials;

▪ Promote the benefits of light steel framed solutions (LSF), namely in terms of:
  ➢ Structural performance;
  ➢ Enhancements in productivity in the construction sector;
  ➢ Enhanced quality of the final products due to possibility of fabrication in a workshop promoting industrialization;
  ➢ Higher adaptability and versatility of the solution;
  ➢ Cost-effectiveness of the solution.
BENCHMARK STUDY

- The benchmark study
  - Worldsteel
  - SAINT-GOBAIN
  - ISISE (UC)
- ISISE (UC) will conduct the structural analysis incorporating all data provided by Worldsteel and SAINT GOBAIN;
- SAINT GOBAIN solutions for wall facades and internal compartmentation will be adopted
- Worldsteel will disseminate all obtained results.
Opportunities for collaboration
OPPORTUNITY FOR COLLABORATION

External walls
Penalisation
Steel framed buildings

Potential industry collaboration between
- Internal lining
- Framing
- Insulation
- External lining and Façade
In typical drywall systems

**THE SIZE OF THE PRIZE – EXAMPLE INDIA**

1m² plasterboard = 1.5lm metal profile

1 lm metal profile = 0.5kg of HDG (0.4mm – 0.6mm)

Increase penetration of drywall by **0.1m²** per head of population

Circa 100Mm² plasterboard = **75k** tonnes HDG = **$55 million**

Drywall penetration in
- India 1m²/capita
- China 1.5m²/capita
- USA >6m²/capita

*At current average price in Asia circa $750/tonne (MEPS Jan 2018)*
Collaboration can

- Unlock significant opportunities for LGSF growth globally
- Accelerate the growth and increase rate of category penetration against traditional build methods
- Ensure we have the right “Ecosystems” in place to support the market development