# Emirates Global Aluminium PJSC
# Enterprise Risk Management Program

## “a perfect marriage between operational risk and financial risk management”

**Middle East GRC SUMMIT 2014**
**Dubai , 10th December**

# Emirates Global Aluminium - A UAE Global Aluminium champion

- **MUBADALA** Development Company and **Investment Corporation of Dubai** (collectively the shareholders of DUBAL and EMAL) have combined their aluminium industry interests in a new jointly-owned, UAE-based entity called Emirates Global Aluminium ("EGA"). Completion of the transaction was achieved in Q1 2014

- EGA's vision is to provide the global economy with sustainable material of the highest quality, building a legacy of excellence for the UAE and the world

- EGA's sole focus is on aluminium, mainly bauxite mining, alumina refining and aluminium smelting

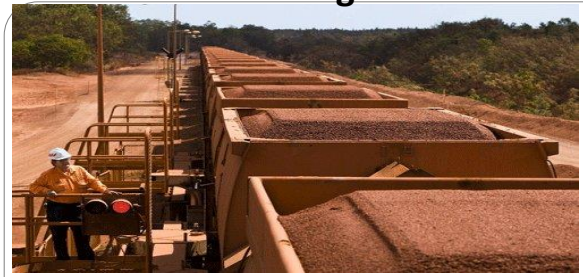
- EGA has combined the ownership of DUBAL and Mubadala's key aluminium interests:

  - Primary aluminium: DUBAL (and its Jebel Ali smelter); and EMAL (and its Al Taweelah smelter) as separate, wholly-owned subsidiaries
  - Bauxite mining/alumina refining: Guinea Alumina Company (100%); Shaheen Project (100%)
  - Various other shareholdings, JVs and development projects

# EGA – Aluminium Value Chain

## Integrated upstream in the Aluminium Value Chain will strengthen EGA's position

### Mining



*Bauxite is the mineral form of aluminium and contains about 30-50% alumina*

**Bauxite Off-take Agreement:**

- Favorable long-term bauxite supply agreement with CBG for 5 mtpa Phase 1 (10 mtpa by Phase 2)

**GAC:**

- World class bauxite resource in the Republic of Guinea
- Development of a 6 mtpa bauxite mine operation along with related port and rail infrastructure -currently completed a FEL1 study

### Refining

*Alumina extracted from bauxite via a refining process known as the Bayer process*

**UAE Refinery Project (Project Shaheen):**

- PFS study concluded early 2013.
- FS study completed in June 2014.
- Refinery to begin operations in 2017 with 2.0 mtpa alumina production, and a 2nd phase of 2mtpa online by ~2021
- Located in Kizad next to EMAL

**GAC Refinery Project:**

- Upon completion of mine and infrastructure, GAC to launch the development of a 2.2 mtpa alumina refinery in Guinea forecasted to be completed by c. 2022

### Smelting

*Smelting is the process of extracting Aluminium metal from alumina through electrolytic reduction*

**EMAL:**

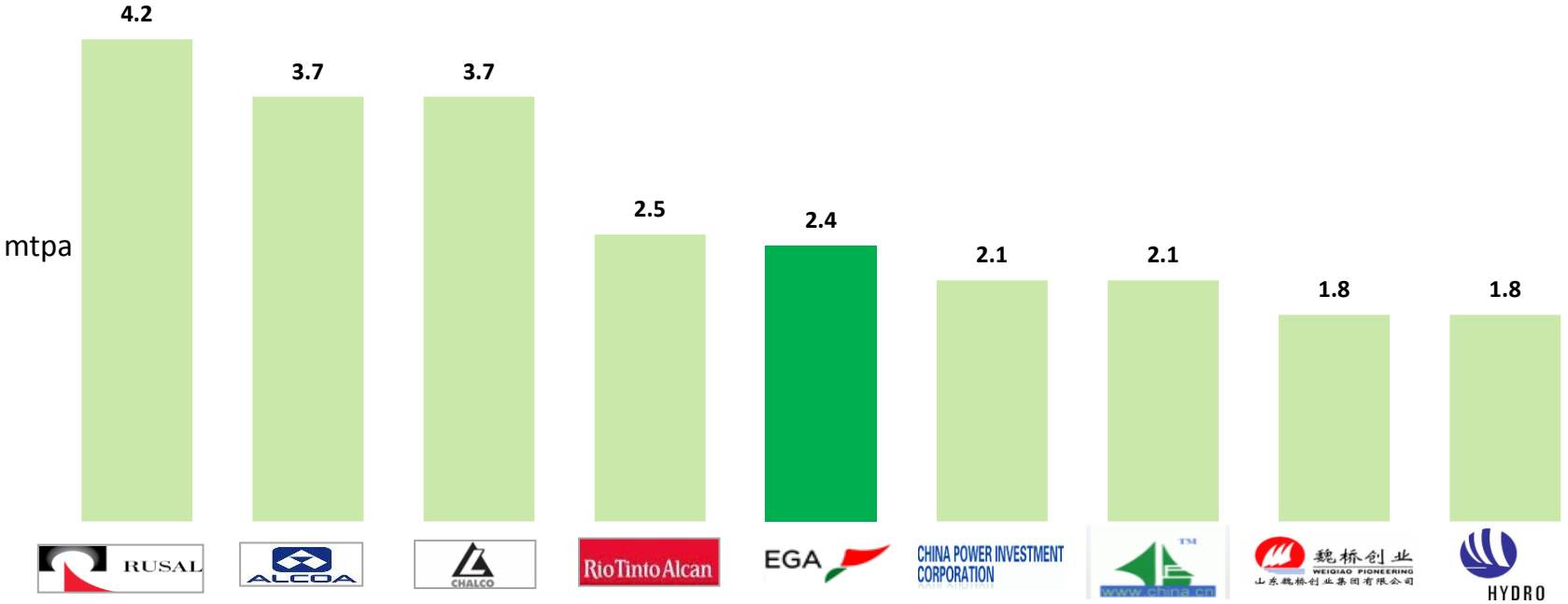
- 1.3 mtpa Aluminium smelter (Phase 1 and 2)

**DUBAL:**

- 1.05 mtpa Aluminium smelter
- Developer of globally leading DX/DX+ reduction cell technology

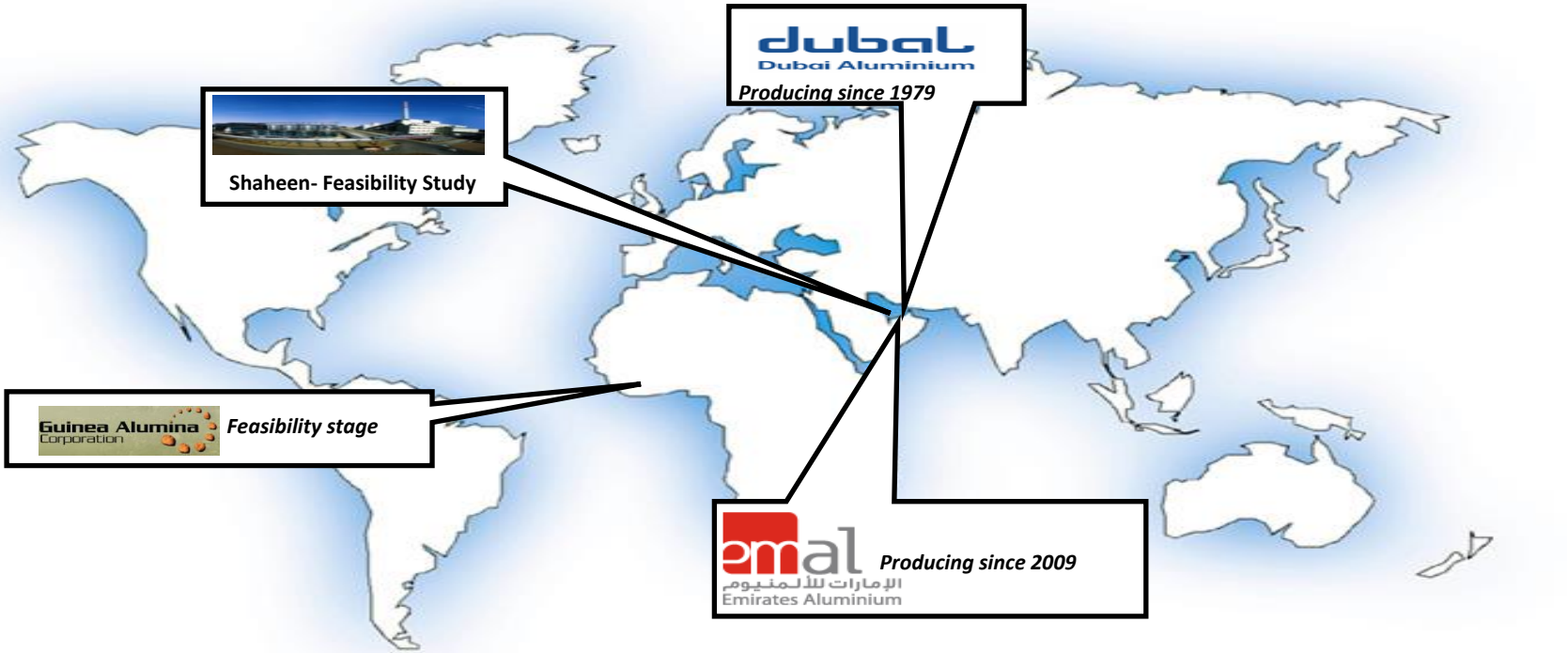
# EGA – A Top 5 Player

- EGA's primary aluminium production capacity of **2.4 million mtpa** places the business among the world's 5 largest midstream aluminium companies.
- The UAE is the 4th largest aluminium producer country in the world.



# EGA - Global Footprint in operations

- **EGA is well established with the intention to grow**




Potential for incorporation into EGA

# EGA - Core primary aluminium smelters

- **Dubai Aluminium (“DUBAL”)**
  - Commissioned end-1979
  - Sequential expansions, advancing technologies
  - Smelter: 1,573 reduction cells in seven potlines (>1 M tpa)
  - Casting operations (>1 M tpa)
  - 2,350 MW power station
  - 30 million gallon/day desalination plant
  - Port facilities

dubal
An EGA Company

- **Emirates Aluminium (“EMAL”)**
  - Commissioned end-2010 (phase I) and mid-2014 (phase II)
  - Smelter: 1,200 reduction cells in three potlines (>1,32 M tpa)
  - Casting operations (~1.6 M tpa)
  - 3,100 MW power station
  - 3.75 million gallon/day desalination plant
  - Port facilities

emal
An EGA Company

# EGA - Upstream projects for securing strategic raw materials

- **Guinea Alumina Corporation (“GAC”)** (wholly-owned)
  - Development of a 6 M tpa bauxite export mine, operational by 2017
  - Development of a 2 M tpa alumina refinery, to begin production in 2022

**Shaheen Project, UAE**

Potential development of an alumina refinery

- **EGA has conducted detailed studies on the feasibility to construct an alumina refinery in relative proximity to EMAL, in two phases:**
  - Phase I: 2 million tpa by 2017.
  - Phase II: 2 million tpa by 2020.

# EGA ERM Evolution

## Prior to 2008 Financial crisis ……

- DUBAL and it's 50% owned joint-venture EMAL are separate companies run by separate executive management.
- DUBAL & EMAL, being commodity manufacturers with a global supply chain footprint and operators of large industrial plants including Power Plants and Ports are naturally prone to significant embedded Financial & Operational Risks.
- Risk Management was practised as a stand-alone exercise by individual Business Units in both companies - a structured Risk management program with enterprise wide visibility, prioritisation and corporate reporting to Board and Senior Management was absent.
- Risk management is mostly viewed in the context of Financial Risk Management and Corporate insurance programs administered by Corporate Treasury Dept.

# EGA ERM Evolution

## Post 2008 Financial crisis ……

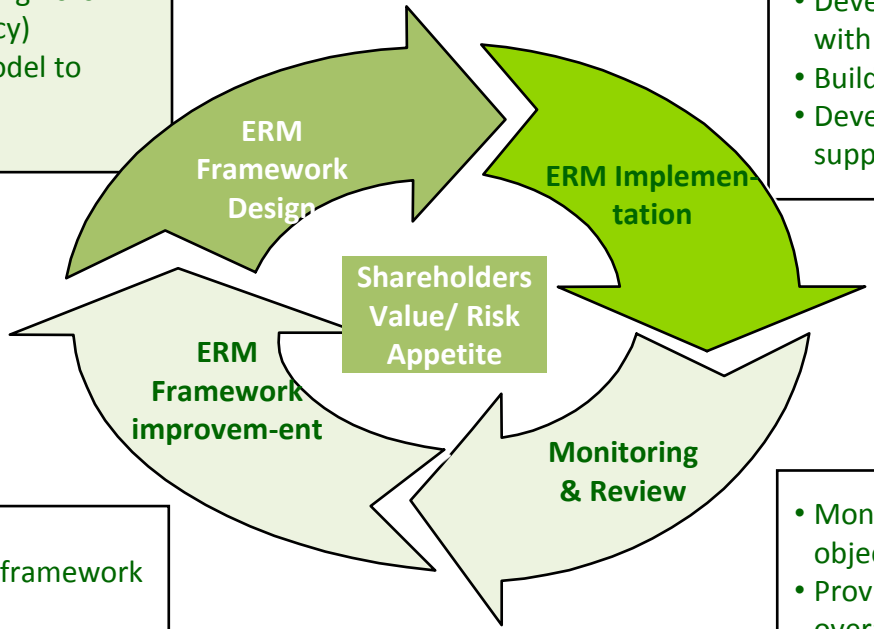
- With the 2008 financial crisis, the Business world become more complex, unpredictable, volatile and risky.
- Shareholders and Boards began to scrutinize whether the business had the right risk management practices in place and demanded more transparency around risks
- Enterprise Risk Management has become increasingly important to the success and longevity of any business.
- ERM program started in EMAL in 2010
- ERM program started in DUBAL in 2011
- EMAL & DUBAL merger in 2013
- Implementation of an integrated ERM Program for EGA group (2014)

# EGA - ERM Program – Key challenges

- To develop and implement a uniform, integrated ERM framework across the group entities with different enterprise values and varying risk profiles.
- To Develop an ERM Program which is balanced in managing Financial Risks and Operational Risks.
- Transition of existing ERM programs in DUBAL & EMAL which have different operational /implementation philosophy into the new EGA ERM Program.
- Roll out an integrated GRC platform which is flexible, scalable and easily provide Risk Reporting at various hierarchical levels.
- To build an ERM system with inbuilt Quantitative Analytics tools to measure quantifiable Risks.

# EGA - Enterprise Risk Management: Overview

- Define the principles and approach to identifiying, assessing, and managing risks across the organization ( ERM Policy)
- Define governance & operating model to support ERM implementation
- Devlopment of Risk Appetite




- Identify and assess /quantify risks
- Develop and implement mitigants in line with shareholders objectives/risk appetite
- Building a Risk Managemnt culture
- Develop required systems & processes to support overall risk management

- Continuously refine/improve ERM framework

- Monitor and review progress against ERM objectives
- Provide full transparency & reporting on overall risks

# EGA - ERM Framework Design

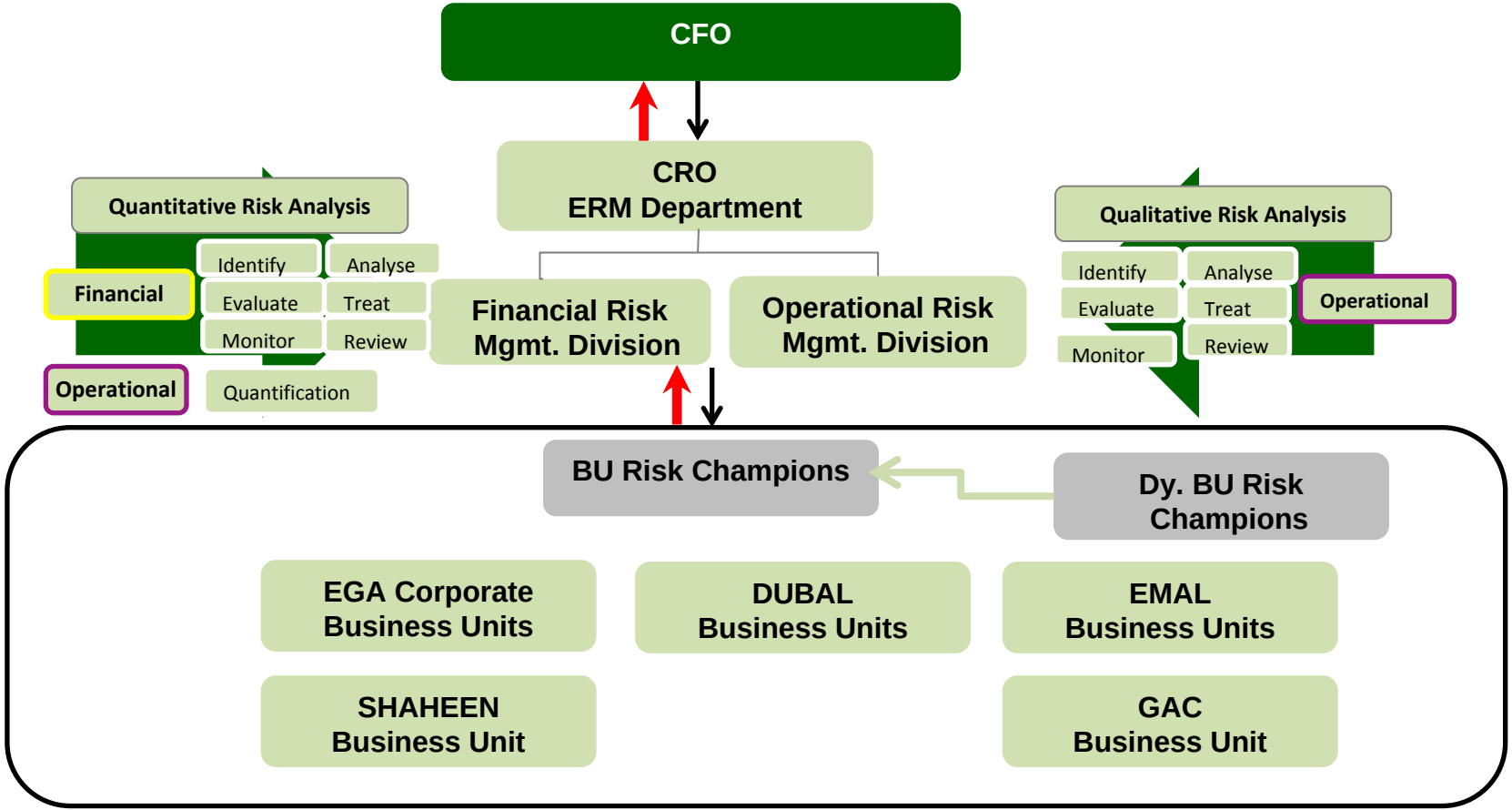
- ERM Policy
- Risk Appetite
- Risk Rating criteria
- Risk Matrix

| Severity Level | Consequence Dimension | | | | |
|---|---|---|---|---|---|
| | Operational | Market | Financial | Strategic | Environment, Health and Safety |
| Catastrophic | Total and prolonged outage of a critical business function (more than 1 month). Production processes massively affected.<br><br>Survival of EGA is threatened. | Prolonged impact, for more than 60 days, on 75% or more of customers by sales volume. Market position severely affected.<br><br>Significant legal or regulatory failure (e.g. resulting in substantial criminal penalties).<br><br>Survival of EGA threatened. | > US$ 500 M | Long term irreparable impact to EGA's global reputation and image.<br><br>Massive loss of global competitive advantage, strategic positioning and shareholder value. | Multiple serious LTI's - Potential Fatality.<br><br>Massive environmental effect; persistent severe damage extending over a large area. |
| Major | Prolonged outage of a critical business function (8 hours to 1 month).<br><br>Production processes seriously affected.<br><br>Survival of EGA is not threatened. | Impact, for more than 15 days, on 75% or more of customers by sales volume. Market position moderately affected.<br><br>Major legal or regulatory failure (e.g. resulting in a visit by regulators in relation to non-compliance).<br><br>Survival of EGA not threatened. | US$ 100 - 500 M | Localised long-term reputation impact with unmanageable outcomes.<br><br>Serious loss of global competitive advantage, strategic positioning and shareholder value. | Severe injury / illness resulting in LTI - potential permanent disability.<br><br>Major environmental effect; extensive measures required to restore area to original state. |

| | Likelihood Dimension |
|---|---|
| Description | Likelihood of occurrence (12 month exposure) |
| Rare | Event may only occur in extreme circumstance, not expected to occur. Less than 1% chance of occurrence. |
| Unlikely | Has not happened but could in exceptional circumstances. 1-10% chance of occurrence. |
| Possible | Has occurred here or elsewhere; may occur at some time, 10-40% chance of occurrence. |
| Likely | Could easily happen or may occ |
| Almost Certain | Event is already occurring or is e occurrence. |

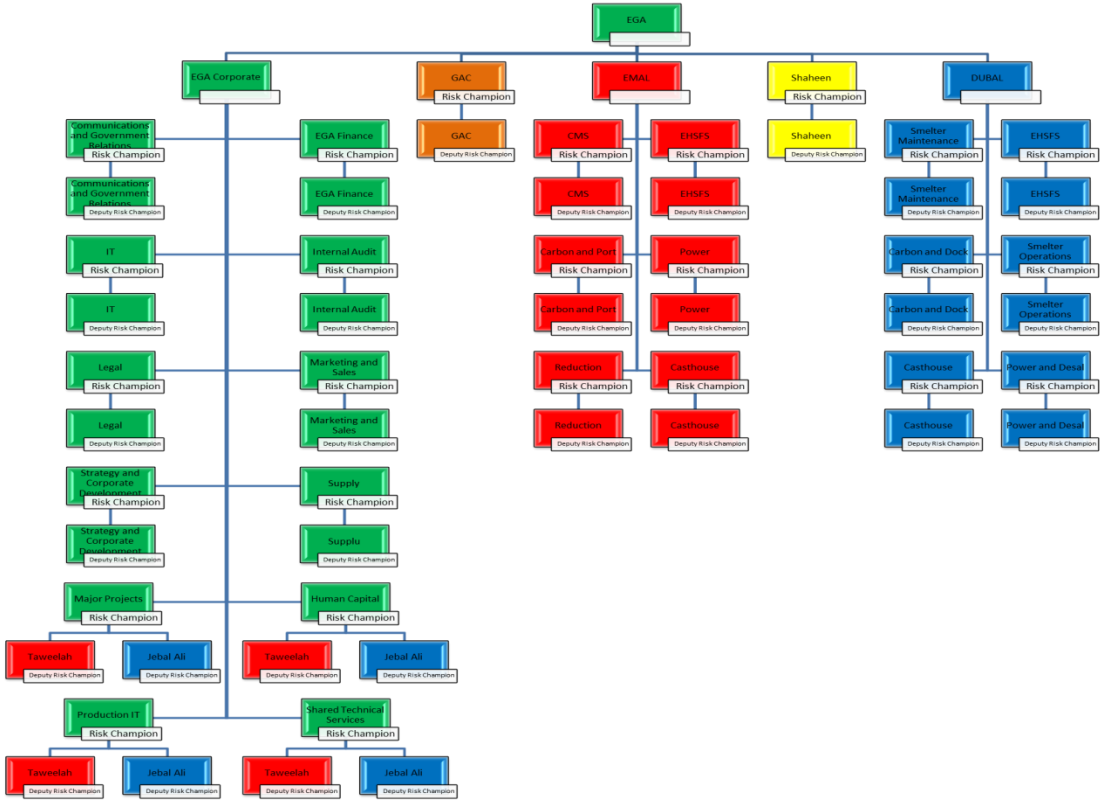
| Likelihood | Consequence | | | | |
|---|---|---|---|---|---|
| | Minor | Moderate | Serious | Major | Catastrophic |
| Almost certain | | | | | |
| Likely | | | | | |
| Possible | | | | | |
| Unlikely | | | | | |
| Rare | | | | | |

# EGA - ERM Infrastructure & Operating model



# EGA - ERM Infrastructure & Operating Model

- **5 entities including 1 Corporate entity**
- **4 locations**
- **30 Business Units**
- **60 RCs & Dy RCs**
- **1 single ERM system**
- **4 FTE ERM Team**



# A highly volatile financial market….

## EUR USD FX Volatility 2005-2014


## Sovereign CDS (ITALY) 2008-2014


## Interest rate (3M Libor) Volatility 2005-2014


## Commodity (Aluminium) Volatility 2005-2014

# EGA - Financial Risk Management overview

## Financial Risk Management

| Risks | Risk Management Tools |
|---|---|
| Liquidity Risk | Value at Risk (VaR) |
| Commodity Risk Management | Spot/Volatility Stress Testing |
| FX Risk | Sensitivity Analysis |
| Interest Rate Risk | Mark to Market Valuation |
| Credit Risk | Cash Flow at Risk |
| | Portfolio Value at Risk |
| | Scenario Analysis |

**Risk Management Systems**

| | |
|---|---|
| Metric Stream | Monte Carlo Simulation |
| SUNGARD | Treasury & Risk Management System |
| Risk AMP | Excel Add on |

# EGA - Operational Risk Management overview

Operational Risk Management

| Risks | Risk Management Tools | |
|---|---|---|
| Supply Chain Risk | Tier I | Qualitative Risk Analysis |
| Energy Risk | Tier II | Risk Modelling |
| Environment, Health & Safety Risk | | Scenario Analysis |
| Information Security Risk | Tier III | Cash flow at Risk |
| Property Damage Risk | | Monte Carlo Simulation |
| Business Interruption Risk | | |
| Project Execution Risk | | |
| Marketing Risk | | |

Risk Management Systems → Metric Stream → Monte Carlo Simulation

# EGA - Risk Quantification

- Assigning a dollar value to an operational risk is a debatable issue
  - some believe that risk is measured and managed by people, not by mathematical models.
  - others believe Quantitative Risk assessment adds more objectivity to the Risk management process.

- EGA ERM philosophy takes a middle ground
  - All financial risks are assessed quantitatively
  - Quantifiable operational risks are assessed quantitatively as a Tier -2 analysis.

- Quantitative risk assessment methodology;
  - Worst, best, likely risk scenarios are developed for operational risks
  - Financial modelling to arrive the financial impact – Minimum, maximum and anticipated
  - Simulate the likely financial impact using Monte Carlo simulation
  - Perceive the effects of financial impact (Maximum possible loss and financial impacts at various confidence levels) on ROI targets and Risk capital of the organizations and also evaluate against the approved Risk appetite.

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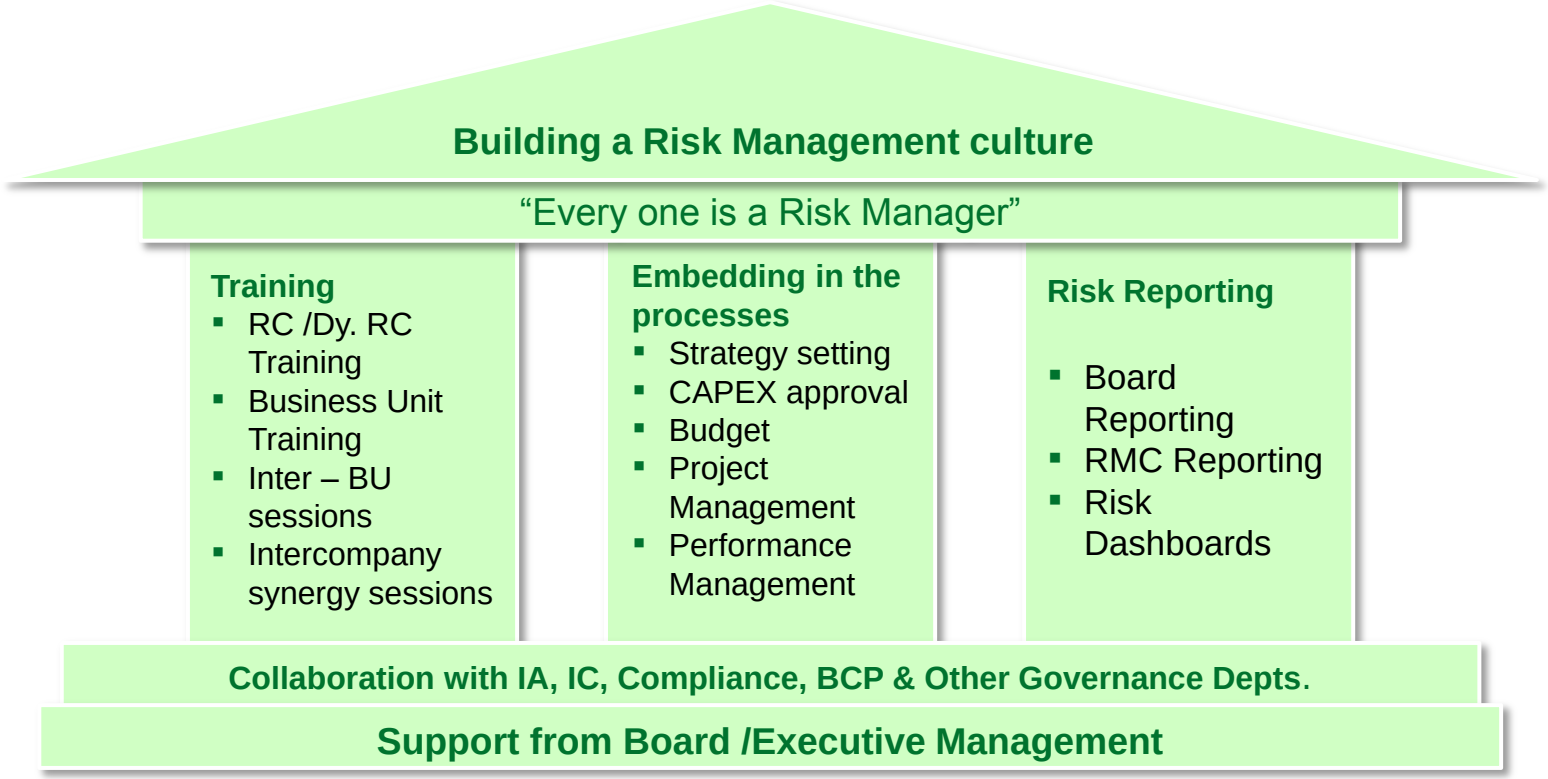
# EGA - Building a Risk Management culture

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# EGA - Technology as an enabler

- Leveraging multiple systems  to achieve best in class risk management
  - Metric Stream GRC System
  - SUNGARD Treasury & Risk Management
  - SAP  ERP
  - Risk Amp for Risk Modelling
  - Bloomberg & Reuters

- Metric Stream Solution Areas
  - Risk Module – by ERM Department
  - Compliance Module – by Internal Controls Department

**Implementation strategy**

- DUBAL Implementation (2012)
  - Project Team comprise of ERM, Compliance, Internal Audit ,IT, Legal and Supply departments.
  - Rigours selection process including reference calls and demos  from 6 shortlisted contenders
  - Phase -1 Standard ERM module implementation ( 1.5 Months)
  - Phase-2  Customized System – Heat Map, Risk Register, Risk Matrix, Risk Reports, Work Flows ( 3 Months)
  - Phase-3 Integration with ‘R” for Monte Carlo simulation (6 Months)

# EGA - Technology as an enabler

## EGA Implementation (2014)

- Metric Stream was selected as the ERM system for the Group during the integration process owing to it's successful stint with DUBAL ERM Program;
- Implementation of the latest version of the platform incorporating DUBAL customizations.
- Embedding a 3 tier organizational hierarchy for risk management & Reporting


- Project time lines – 1.5 months
- Scalable for future expansions

# EGA - Technology as an enabler

## DUBAL ERM System

- Single Organization
- 14 Business Units
- 28 Risk Champions & Dy RCs
- Metric Stream ERM system
- ~ 4000 employees
- 2 Tier Risk Reporting
- ERM Team Strength – 1.5FT

## EGA ERM System

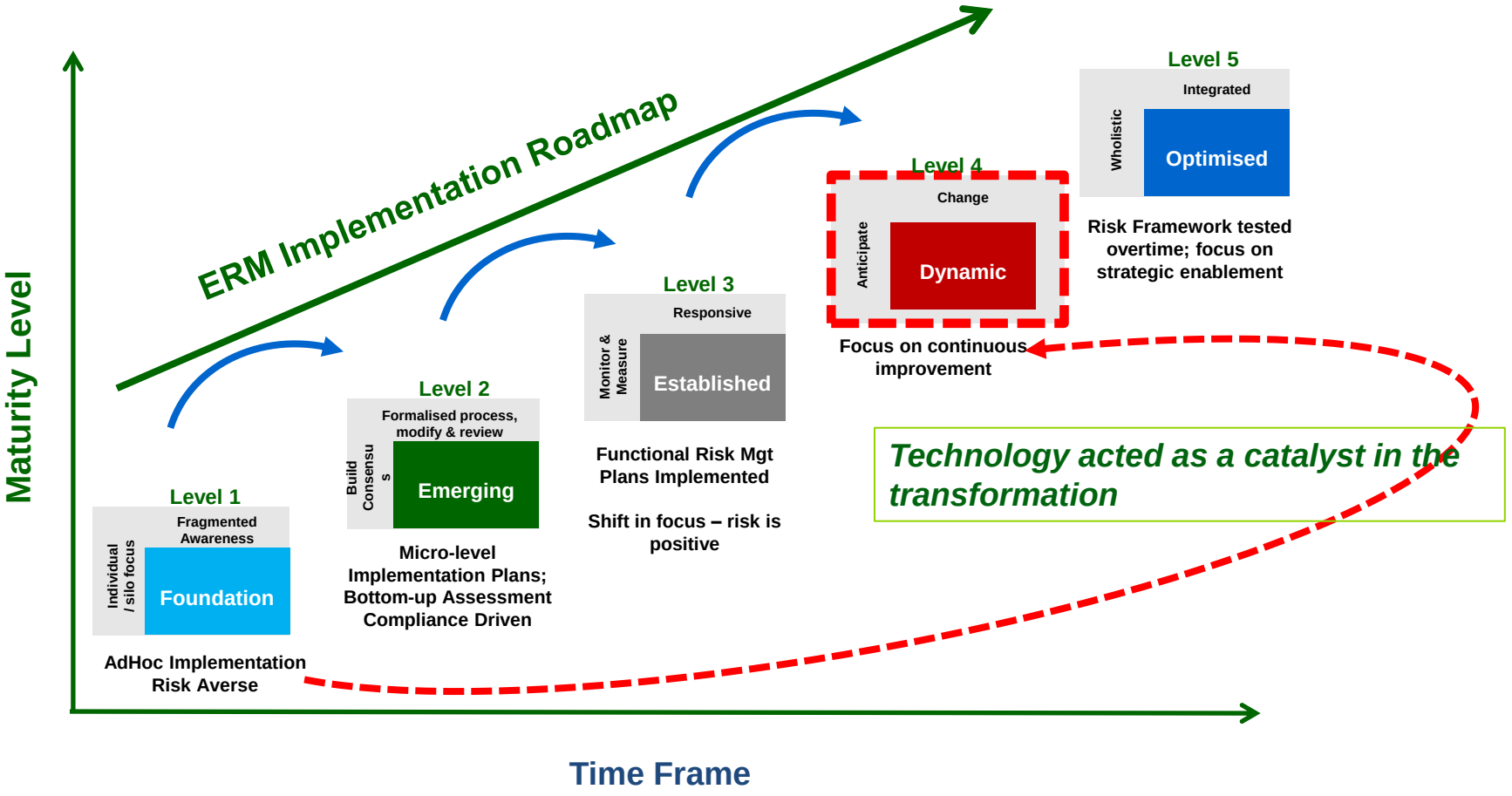
- Multiple Organizations (5)
- 30 Business Units
- 60 Risk Champions & Dy RCs
- Metric Stream ERM System.
- ~ 7000 employees
- 3 Tier Risk Reporting
- ERM Team Strength – 4FT

## EMAL ERM System

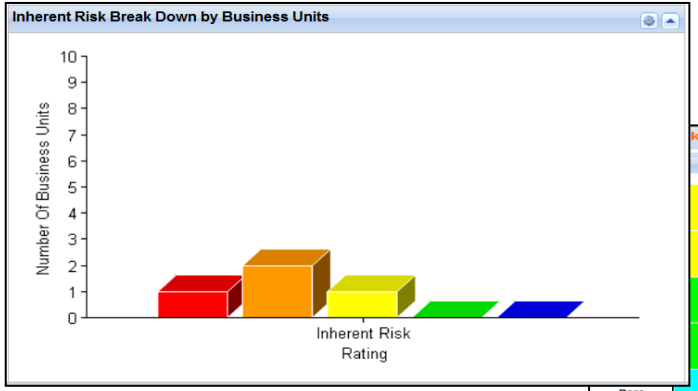
- Single Organization
- 15 Business Units
- No Risk Champions
- Excel based Risk Register
- ~ 3000 employees
- 2 Tier Risk Reporting
- ERM Team Strength – 1FT

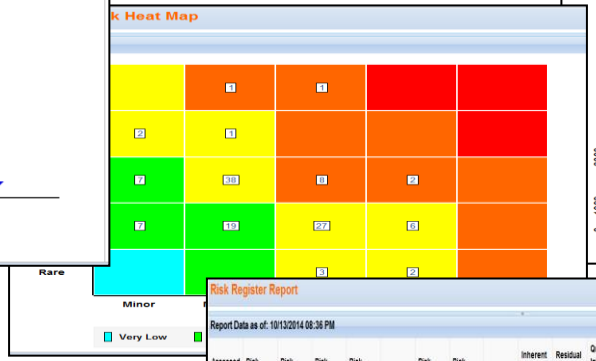
**SHAHEEN & GAC**

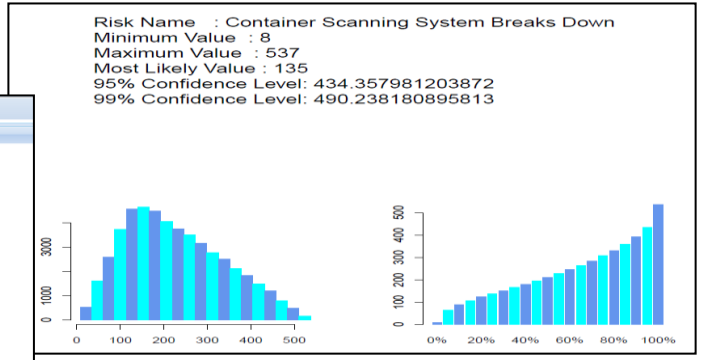
# EGA - ERM implementation Roadmap

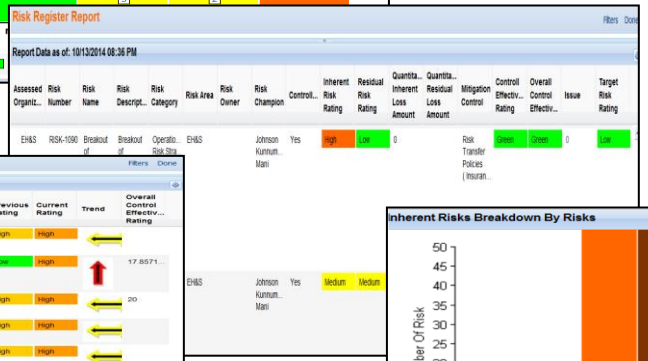


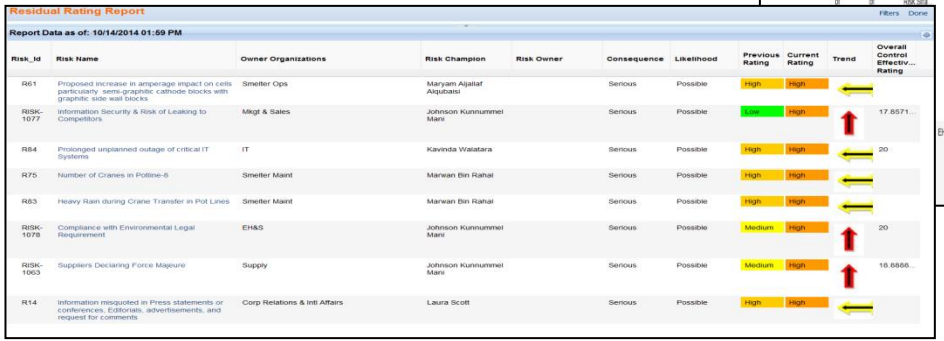
# EGA – Metric Stream customizations

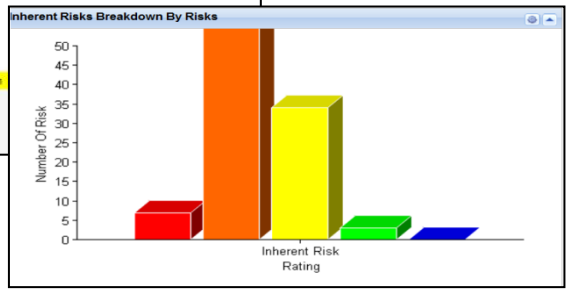


# EGA – ERM Successes and Benefits

## DUBAL ERM Program

- Rolled out ERM program from scratch to 14 Business Units within a short span of 1 year generating the Corporate Risk Register and Heat map with top 100+ Risks.
- The entire program has been rolled out in-house with 1.5 Full time employees (FTEs) against the budget of 3 FTEs bringing tangible ROI on the system.
- Reporting timing has been reduced to half a day from 1 week through customized Real -time reports, Risk Register and Heat maps.

## EGA ERM Program

- Successful roll out of a group level ERM program with 4 entities on board , generating the Corporate risk register and Heat map with 120+ Risks within the first year.
- Smooth transition of 2 ERM programs into an integrated Program.
- Lean risk department eliminating the administrative support through system automation.
- Quick system implementation – Project timeline 1.5 Months
- Real time Reporting capabilities including Risk Dash Boards

# EGA – Recognition and Awards

- **GRC 2020 Value Award in Risk Management for Year 2014**

- **Treasury Team of the Year Award for Year 2013 – ACT Middle East**


# Key Learning points

- Each ERM program is unique.  There is no single fit for all. ERM Programs should be designed having regard to the nature of the business, overall enterprise value, shareholder's attitude towards risk and overall risk landscape of the organization.

- Use both Top down and Bottom up approach in implementation
  - Top down approach in building a risk culture, linking to strategy and performance management.
  - Bottom up approach in day to day ERM activities.

- Give the right place to quantitative risk assessment in the ERM program.

- Use the technology in the early stages of the ERM program which will serve as a catalyst in attaining maturity and in propagating risk management initiatives.

- Embed the risk management in various processes  to accelerate the risk management culture;

- Pay attention to "opportunities"  as well .

- Collaborate closely with other Assurance providers and Governance departments

# EGA - Next steps …….

- **Developing a data based Risk management Platform by integrating Metric Stream with SAP ERP system**
  - Developing a real-time KRI Dash board with an Early Warning Signals
  - Real Time Incident management through linking with SAP incident reporting

- **Value capture through a developing a tightly integrated GRC platform**
  - Preparatory works have been started to on-board the other governance departments into the Metric Stream GRC Platform to leverage the Hardware & Software capabilities;
    - IT Governance
    - Supply Governance
    - Compliance

# Thank you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2014 GRC Value Award
Risk Management
DUBAL
October 2014
Michael Rasmussen, The GRC Pundit @ GRC 20/20
VALUE
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Governance, Risk Management, & Compliance Research