Environment Drivers – Qatalum

Arabal 2013

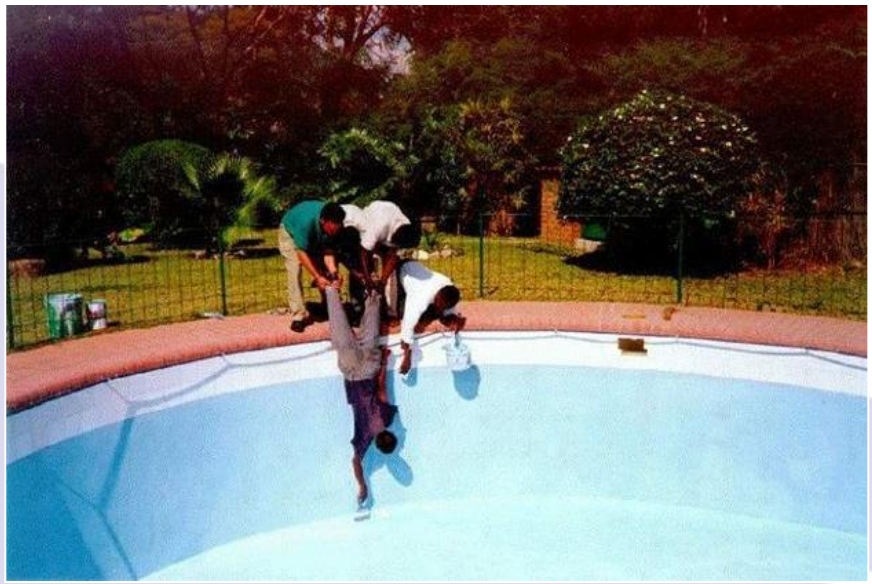
M Odeh

Presentation Outline

- Safety Moment
- Design & Operating Standards
- Environmental Inputs – Outputs
- Water
- Solid Waste
- Emissions

Safety Moment

Use the right tools



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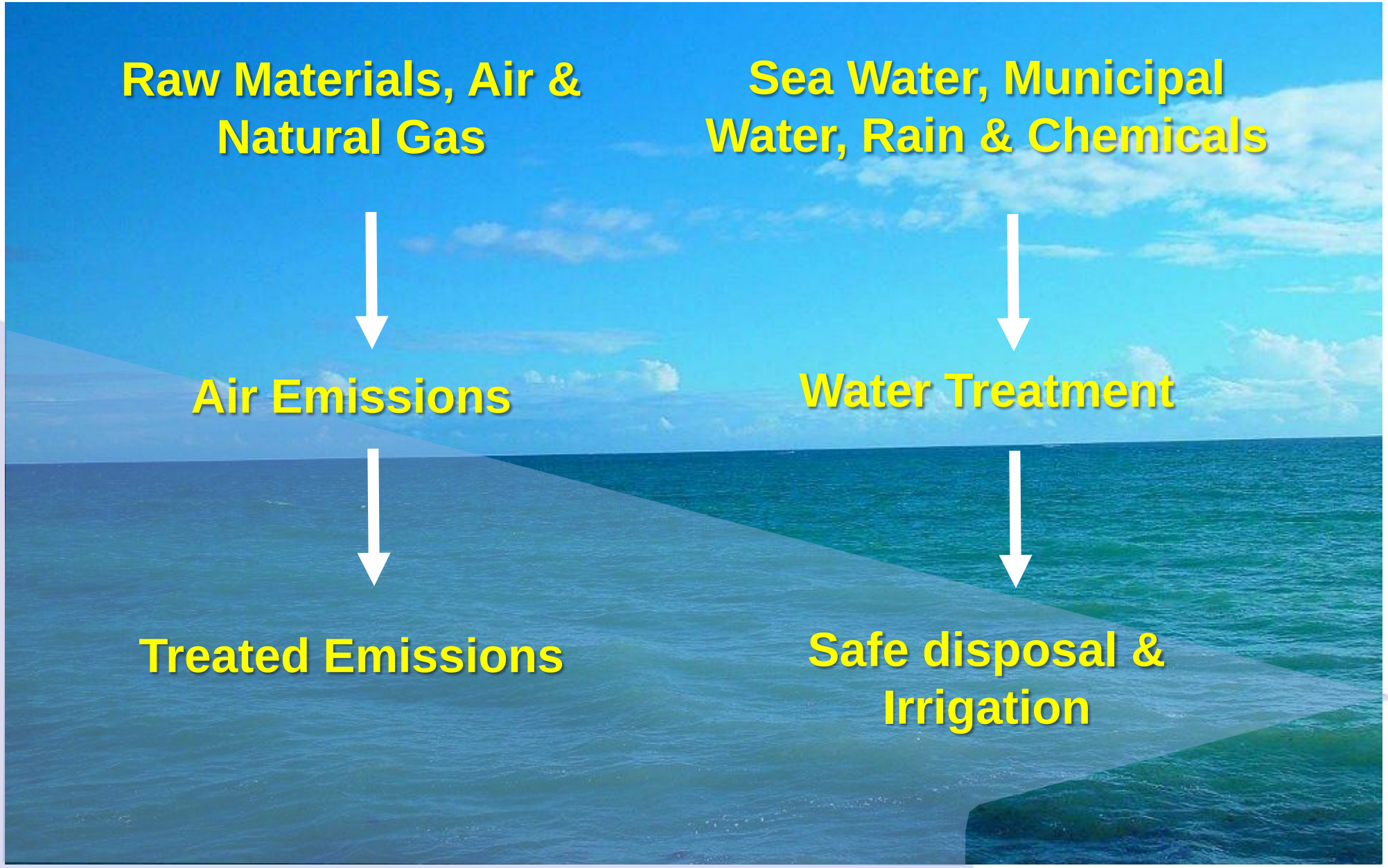
Design Standards

GCC Smelters:

- **EIA for Approval**
- **International Construction Standards**
- **International Standards**
- **Local Standards**
- **Consent to Operate**
- **Corporate Social Responsibility**

The Environment



Water

IN: Seawater, Municipal Water, Rain, & Chemical

- **Seawater Effluent** — **Chemical Treatment/Aeration**

  (16,000 m^3/h. Caustic soda is used for pH correction)

- **Freshwater Effluent** — **Chemical Treatment/Oil Removal**
- **Sewage** — **Sewage Treatment**
- **Rain Water** — **Chemical Treatment, if required**

Almost all TSE is used for irrigation

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Solid Waste

Sources of Rejects/By-Products

- **Normal Operations:**
  - **Non-Hazardous (for Disposal & Recycling)**
  - **Process By-Products (carbon powder, CCM, scrap, etc.)**
- **Start-Up: Process By-Products (pots & other units)**
- **Power Outage: Process By-Products (August 2010)**
- **Construction Phase: Excess materials & waste**

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Solid Waste

Types of Waste – End Use

- **Non-Hazardous Waste – Disposal Locally**
- **Hazardous Waste – Treatment/Disposal Locally**
- **Recyclable Waste – Paper, Plastic, Steel Locally**
- **Aluminium Dross – Processed for Cold Metal**
- **Spent Potliner (SPL) – Use in other Industries**

Solid Waste Management

Color coded/labeled waste skips – segregate at the source

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Before & After Cleanup

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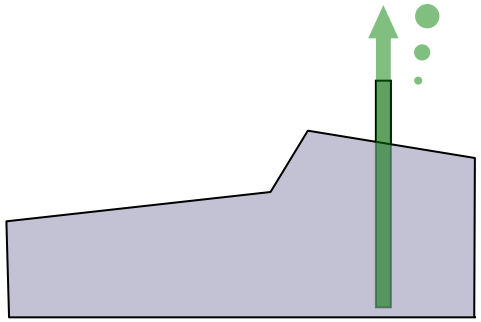
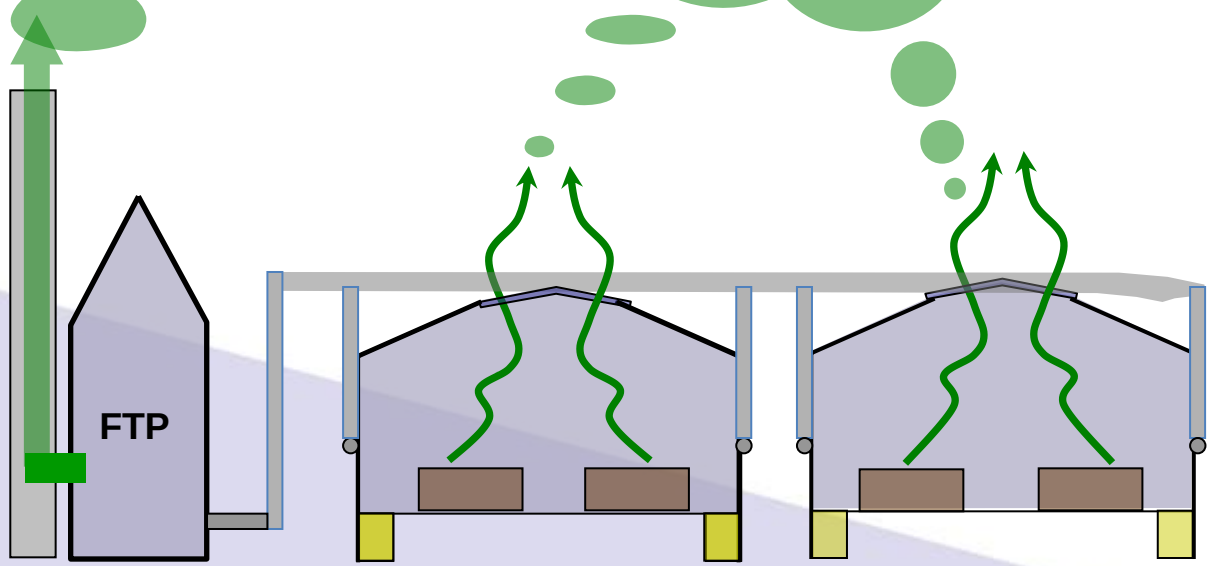
Emissions

Combustion Products NOx, Carbon Dioxide



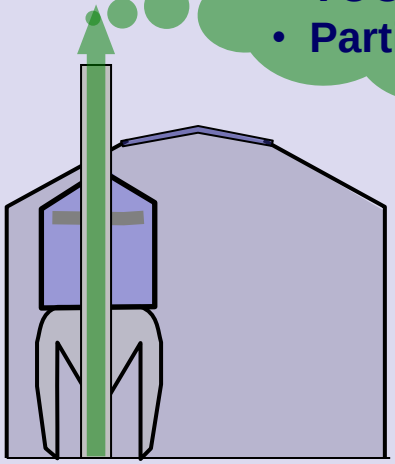
Power & Casting

- Fluoride
- Sulphur Dioxide
- Carbon Dioxide
- Particulates



Reduction

- Fluoride
- Sulphur Dioxide
- VOC
- Particulates



Carbon (Bake Furnaces)

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Emissions

In: Natural Gas, Air, & Raw Materials

Out: Emissions, Dust, & Gases (HF , SO2, CO2, NOx, SOx)

Installed:

- **Dust Collectors**
- **Fume Treatment Plants**
- **Carbon Fume Treatment Canters**
- **Power Low Nox Burners**

} **Treated Emissions**

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Fume Treatment Plants

Four Fume Treatment Plants

Purpose of FTP:-

- **Gas suction to capture:**
  - ✓ **HF (hydrogen fluoride) gases**
  - ✓ **HF particulates,**
  - ✓ **SO_2 (Sulphur Dioxide)**
  - ✓ **CO_2**

- **Booster Fans trigger Forced Gas Suction during pot tendering activities. (*min/eliminates fume escape)***
- **Al_2O_3 (primary alumina) used to scrub gases. (Also enriched and fed back as secondary alumina)**
- **Dust monitoring instruments provide live feedback to operators & allow identification of emissions**
- **Seawater/wet scrubbing clean sulphur dioxide (SO_2). *Seawater effluent is treated & released***

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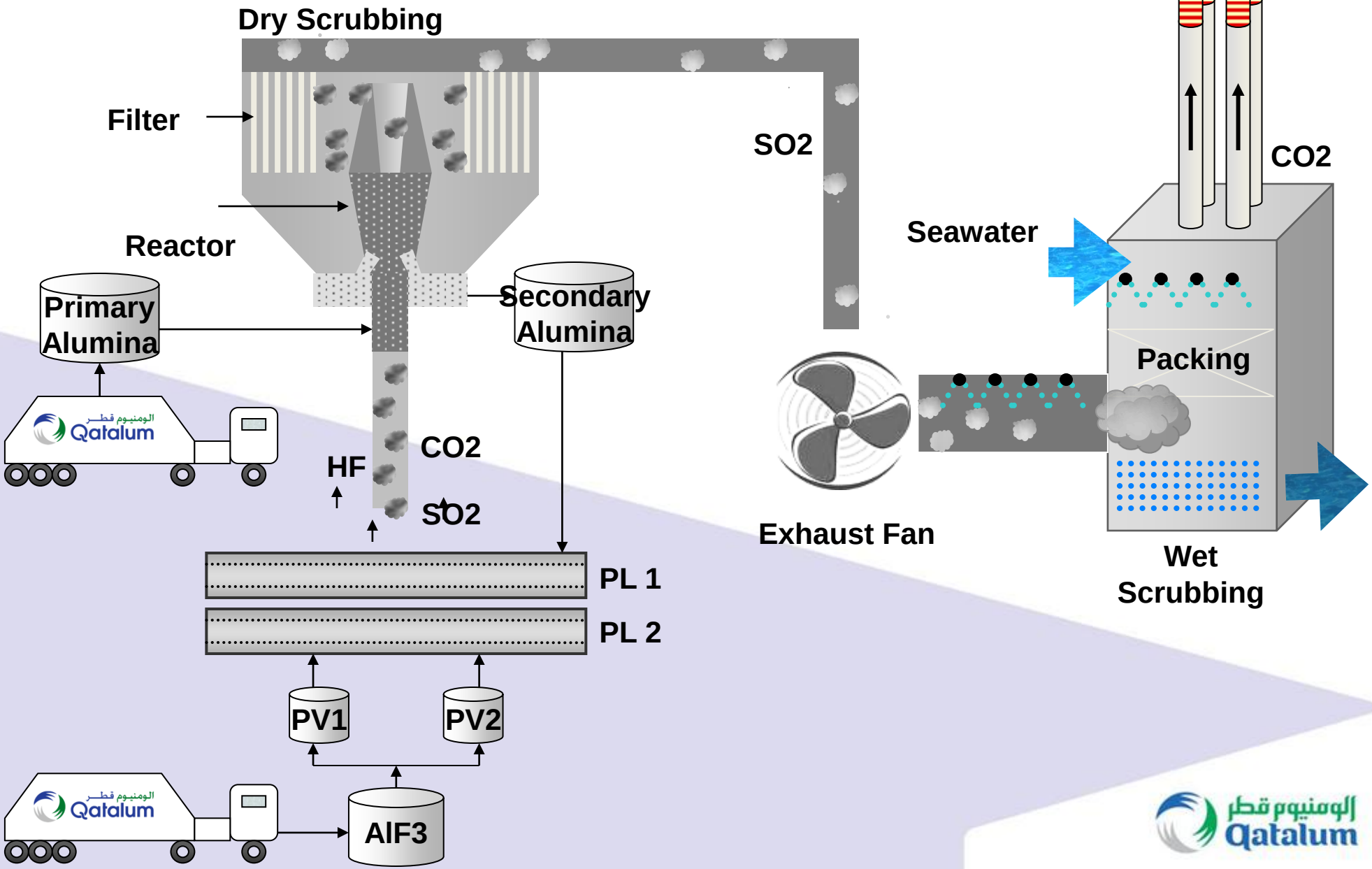
Fume Treatment Plant Illustration



Power Plant – Contribution to Low Emissions

- Installed Equipment
  - Highly Efficient State of the Art equipment – 4GT Frame 9FA in Combined Cycle Configuration
  - Large Gas Turbines – More efficient than smaller gas turbines
  - Dry Low NOx burners on GTs
  - Seawater Cooling Tower – Reduces seawater temperature rise
- Fuel
  - Natural Gas only
  - Low Sulfur Content

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Power Plant – Contribution to Low Emissions

- **Efficient Operation**
  - **Higher efficiency means lower amount of emissions, less CO2**
  - **Regular tuning of GTs ensures minimum NOx & CO production**
- **Active Emission Control**
  - **Selective Catalytic Reduction (SCR) for NOx reduction – to 5ppm; via catalyst in Combined Cycle Stack in combination with injecting aqueous ammonia**
- **Continuous improvement**
  - **Improvements to operating regime and installed equipment improve efficiency & reduce environmental impact.**

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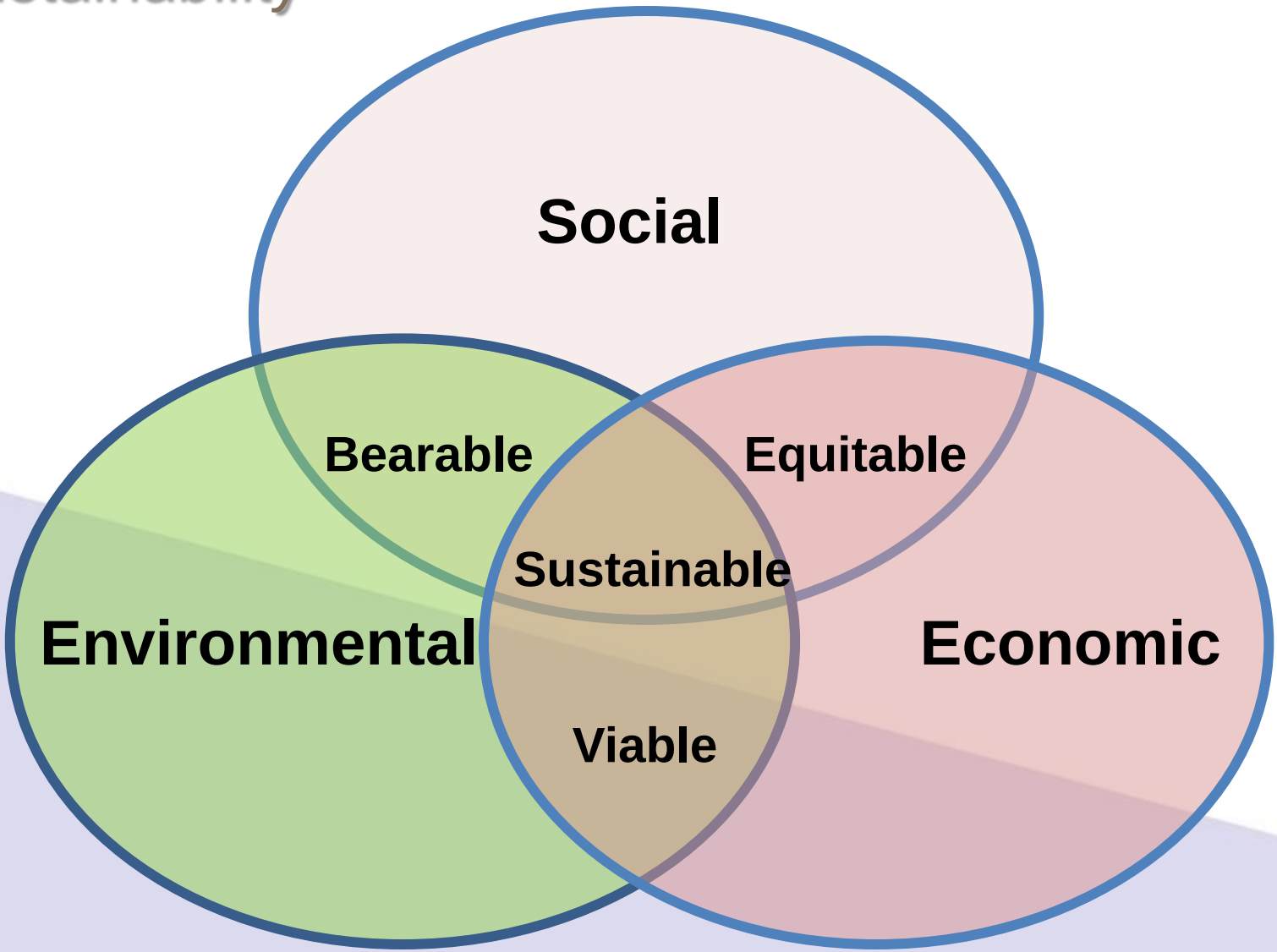
Sustainability



Thank you

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