



ArcelorMittal

Making Energy Savings a *Reality*

Saldanha Works - A Case Study

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Energy Environment in South Africa



**AFRICAN
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WEEK**

DELIVERING BEYOND TOMORROW

**"Challenges are what make life interesting;
overcoming them is what makes life
meaningful."**

Joshua Marine

Framework



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- Summary Background on Saldanha Plant and Process
- Why Energy Efficiency is a priority?
- Saldanha Performance Review
- Saldanha Approach for Sustainable Energy savings
- Key Success Factors
- Project Detail as examples
- Conclusions

Arcelormittal Saldanha Works

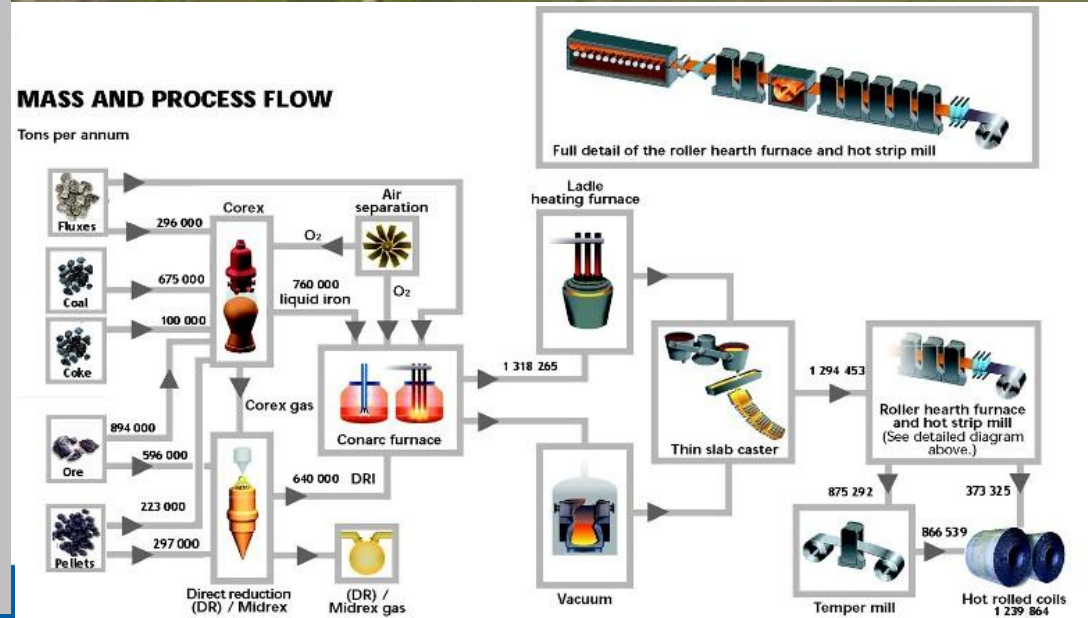


Background



Statistical information

- Electricity demand : 160 MW
- Daily water consumption:
8 000 kilo liters (world best for an integrated steel plant)
- Manpower: 548 permanent employees (support 7200 permanent positions)
- Sales output: 1,2 million ton HRC/annum



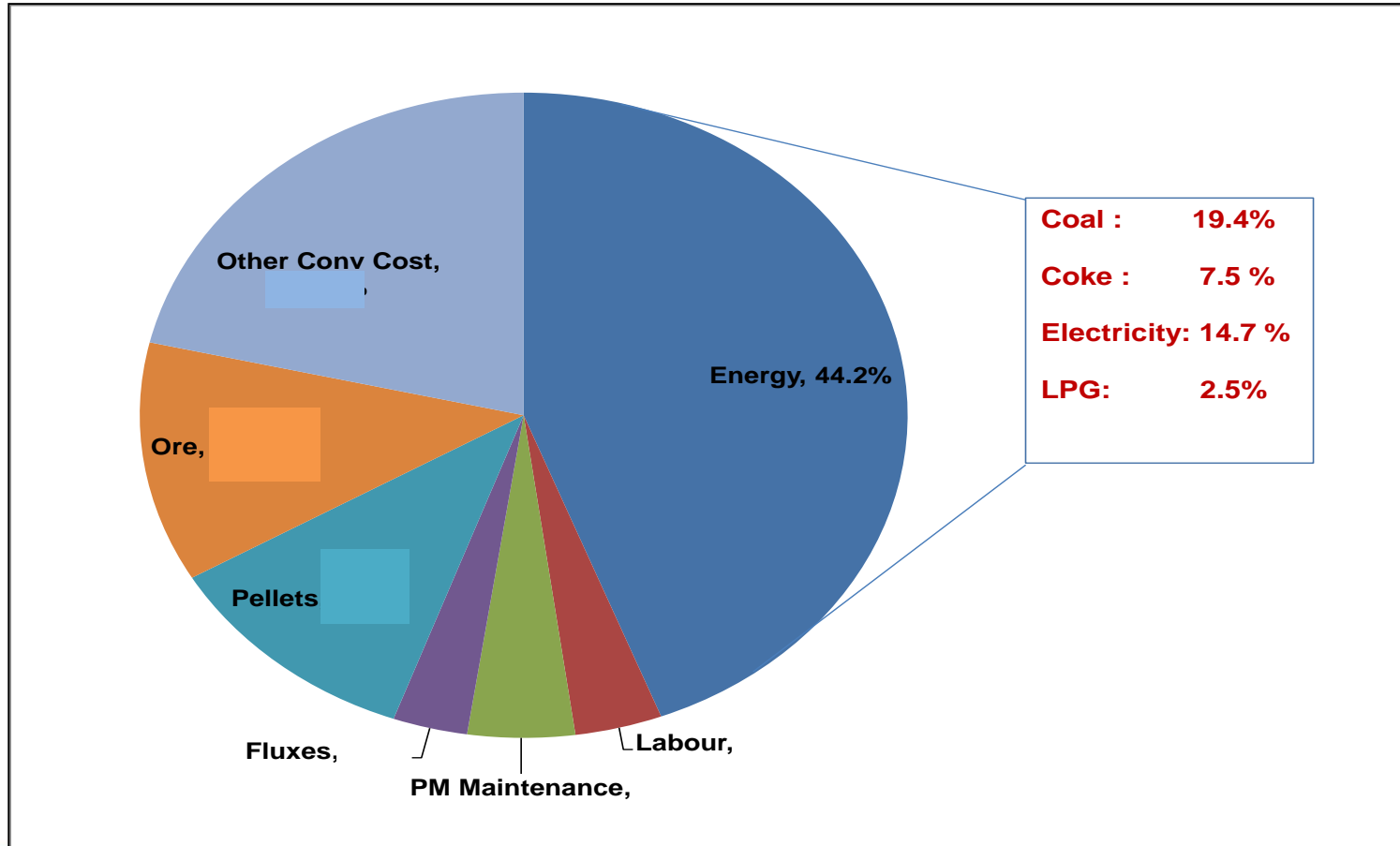
Why Energy Efficiency : 2013 Allocation



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- Energy related components is 44% total cost structure.



Achieving Energy Savings



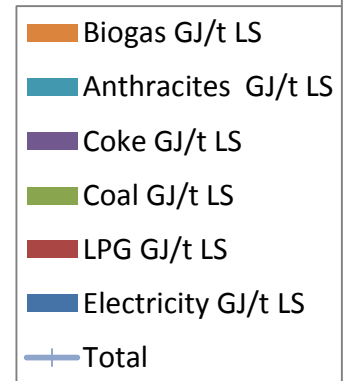
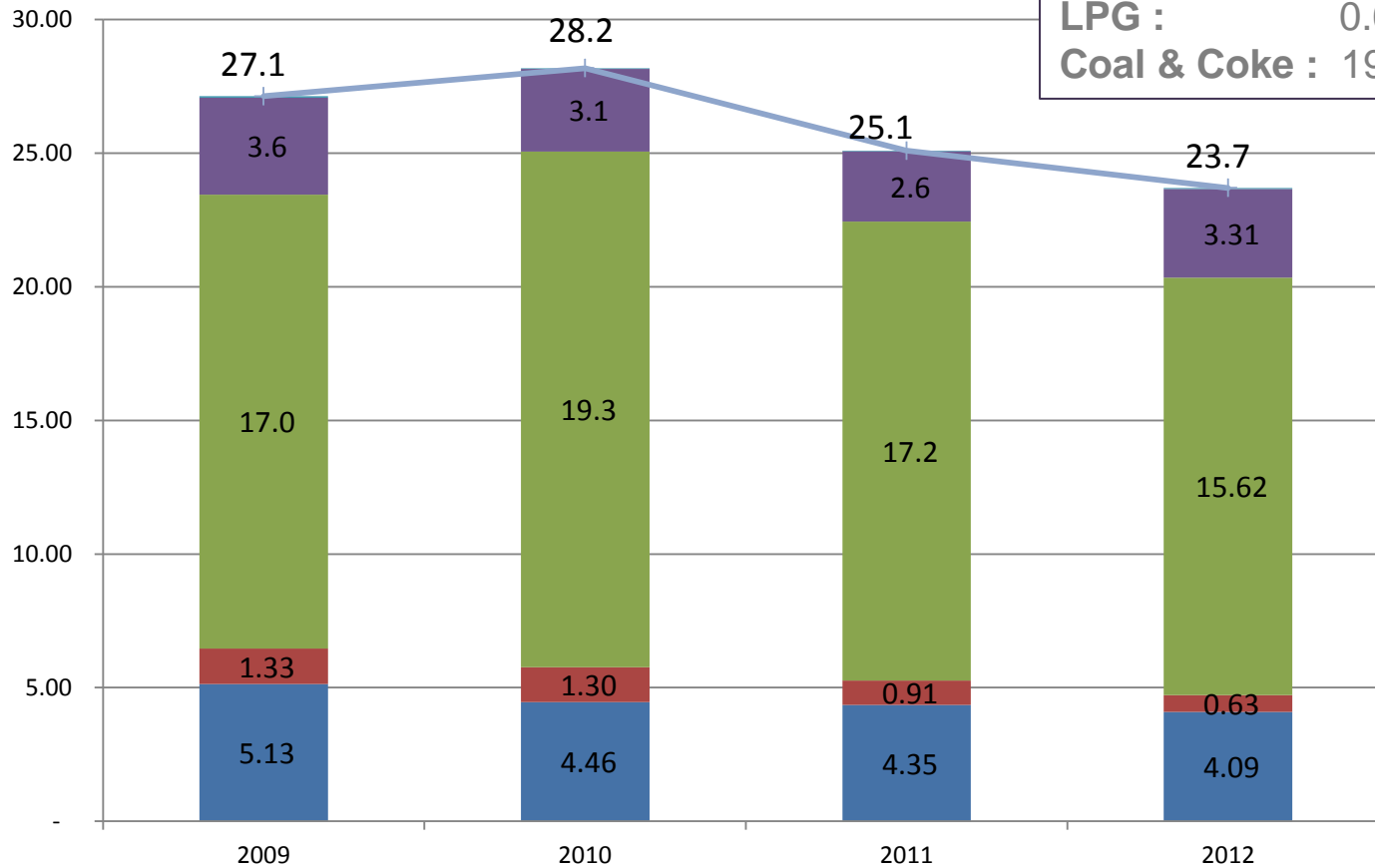
WHAT WENT WELL

1. 10.6 MW av. Electricity demand saved against baseline
 - Total 6.6% saving on baseline
 - Electricity Saving value : R51m (including R28m from load-shedding)
2. LPG Saved : 3218 t or 20% with value R39m
 - Overall saving of 41% compared to baseline.
3. Reduced Energy Consumption from 25.1 to 23.7 GJ/t HRC.
4. Fifteen energy projects completed
5. EnMS ISO 50001 internal audit score 94+%.

Energy Contribution by Source



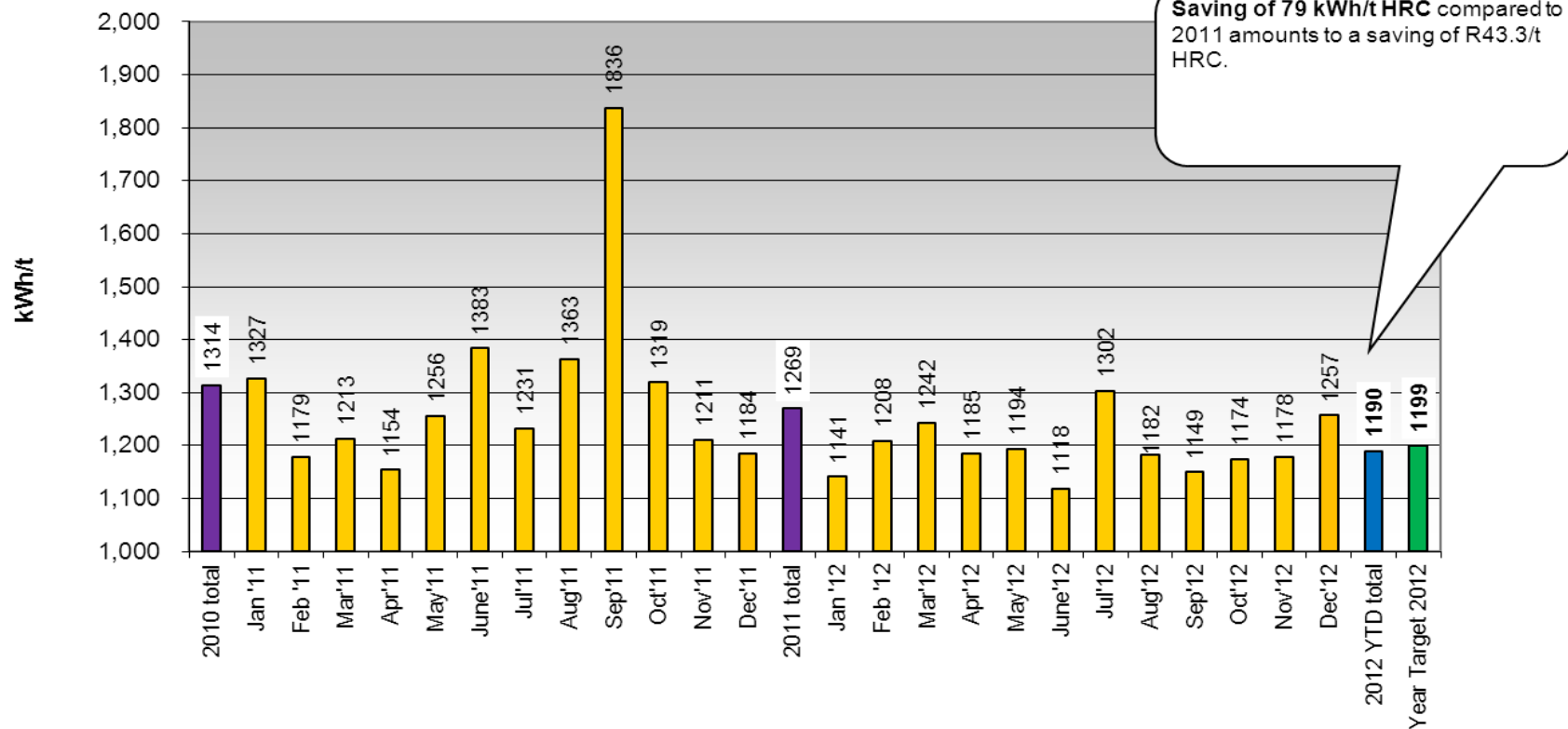
	<u>2012 Targets</u>	<u>Actuals:</u>
Electricity	1199 kWh/t	1190
or	4.2 GJ/t	4.09
LPG :	0.66 GJ/t	0.63
Coal & Coke :	19.4 GJ/t	18.9



Electricity



Electrical Consumption Saldanha



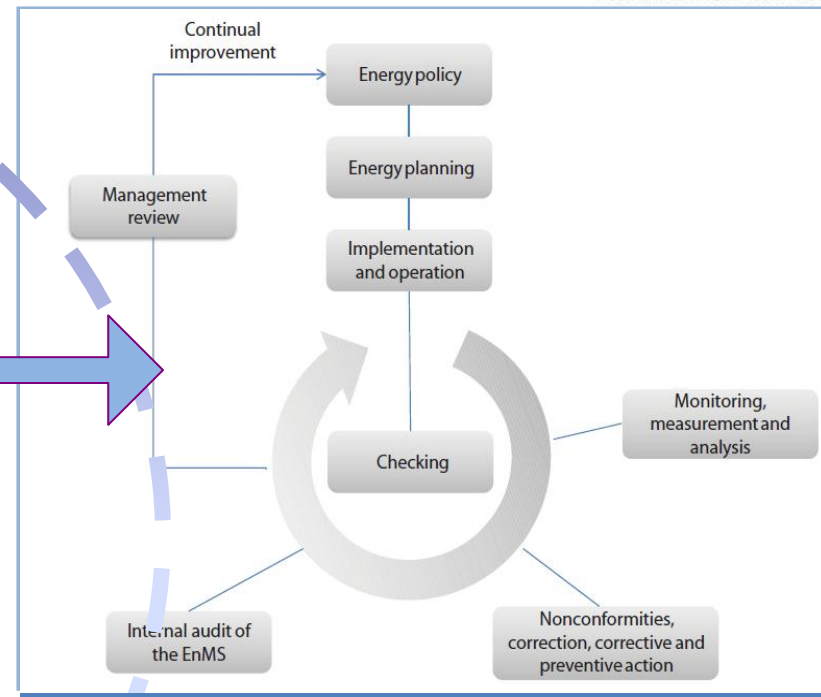
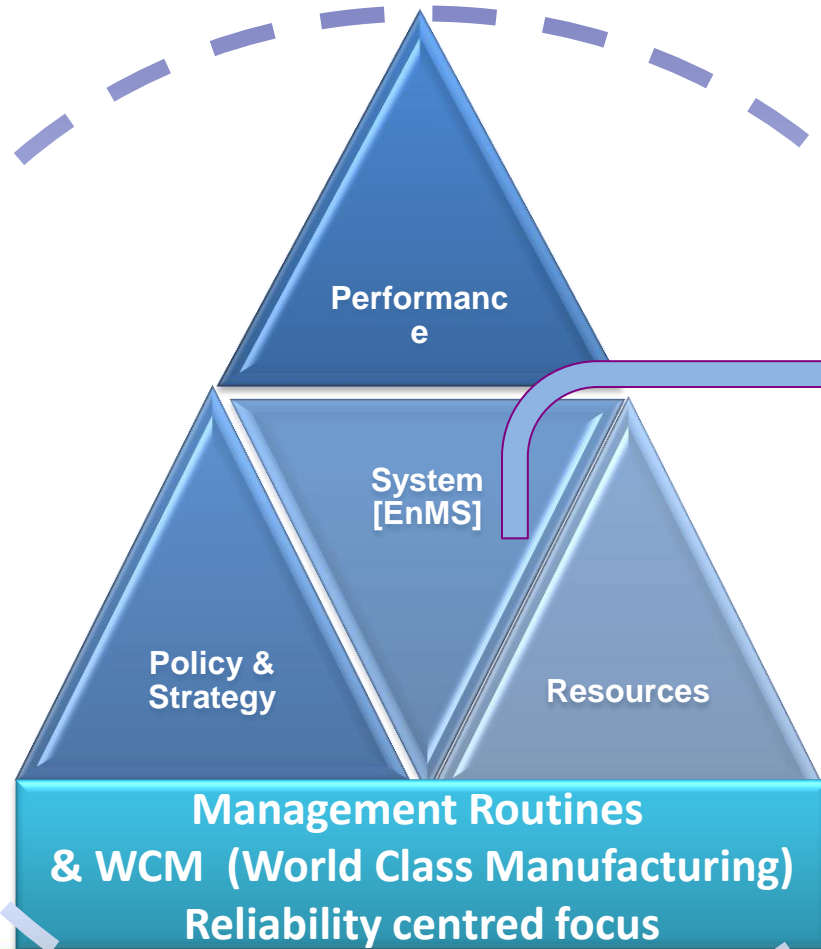
Saldanha Approach



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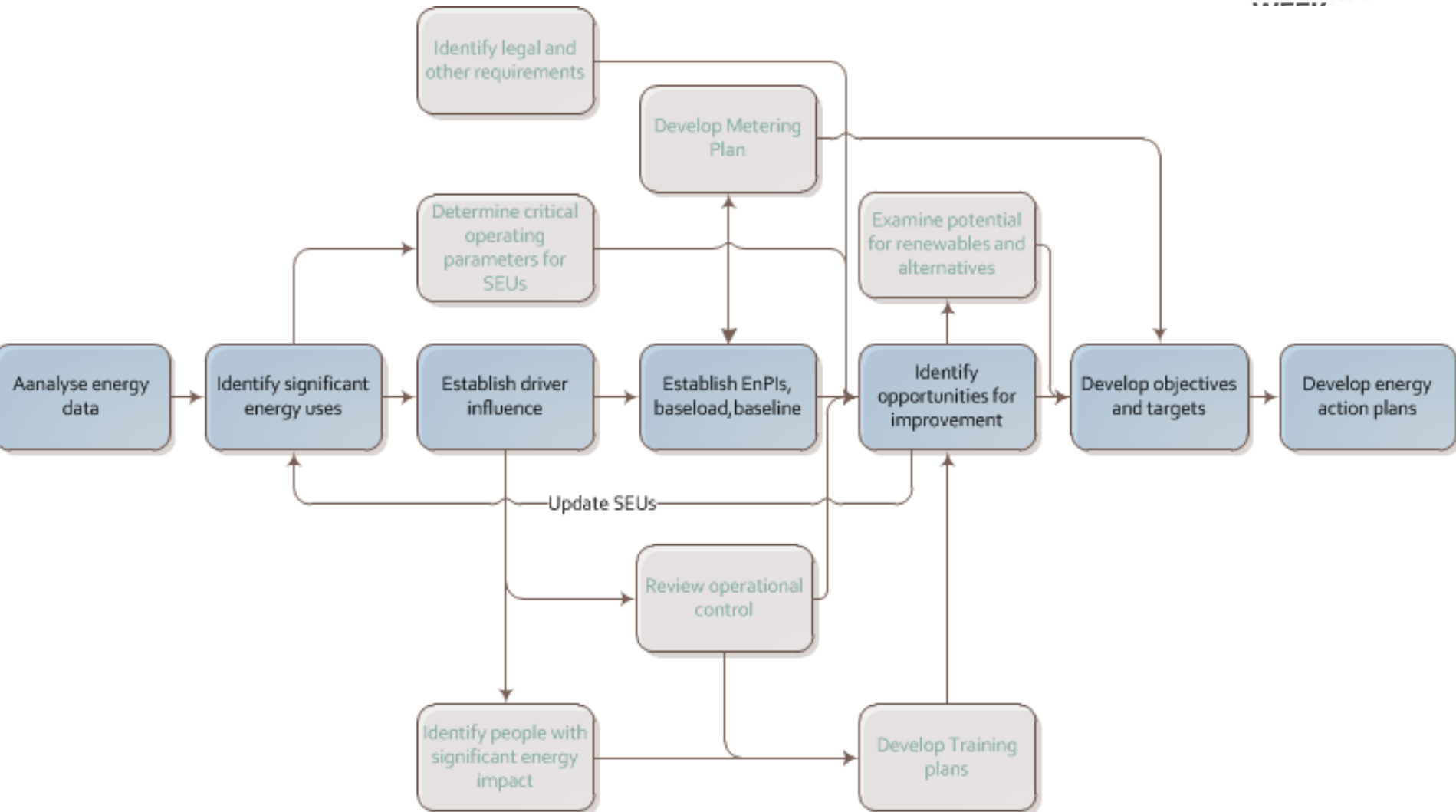
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Energy Management Sustainability



Management Infrastructure

Process Flow





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Key success factors

1. There must be an Energy Strategy and Energy Management Program with :

- Management commitment.
- Understanding potential and opportunities and having an implementation plan.
- Allocating resources to energy management.

2. WCM (World Class Manufacturing program) assisted in energy efforts

- Having reliable operations.

Key success factors



3. IEE Programs hosted by NCPC (UNIDO, DTI and DOE)

- Affordable training from world class experts to assist and guide improvement programs and initiatives.

4. Sustainability can only be achieved through :

- ISO 50001
- Management Infrastructure (MI) - closing the loop with control items in routine meetings.

Summary of Projects completed



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Total Value of savings: Approximated at R127m

1. Technology

- **VSD's : 1 project** - Exceeded initial estimated savings.
- **Waste Heat utilisation from Roller Hearth Furnace** -
Replace Diesel heater at air separation plant (R15m saving/ R13m investment).
- **Lighting Replacement**

Summary of Projects completed



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2. Operational Efficiency

- Air Separation Plant – compressed air and oxygen, improved communication (C04 switch off)
- RHF
- WTP pump system (UNIDO pilot plant)
- WTP system 14
- ArcelorMittal Best practices for Energy Consumption

3. Operational Efficiency - Innovation

- LPG savings
- Conarc energy input – DRI quality, Transformer operational settings, foamy slag practice
- O2 purity

Summary of Projects completed



4. Eskom Tariff structure – scheduling of energy inputs

- Winter peak tariff – utilise chemical energy

5. ISO 50001 & Improved reporting

- Empower area managers to set targets and manage their energy consumption.

Project Detail : LPG Reduction



Project Statistics	Actions and detail
<p>LPG Reduced Consumption</p> <p>Trigger : Cost and shortage of LPG</p> <p>Approach : Review operational assumptions and change operational principles and philosophy.</p> <p>Implementation : Q4 of 2011</p> <p>Value of Saving :</p> <ul style="list-style-type: none">• 26% or R 52 million for 2011• A further 20% or R 39 million saving for 2012 realised.• Reduced from 1.3 GJ/t to 0.63 GJ/t	<p>Preparation :</p> <ul style="list-style-type: none">• Restore Corex basic conditions with Tap hole repair and WCM program. This ensures stable operations and high availability of DR gas. <p>Change in practice :</p> <ul style="list-style-type: none">• Enrichment of DR gas• Reduce LPG used in cooling zone• Countered impact through tempo adjustments <p>Results :</p> <ul style="list-style-type: none">• Midrex : LPG consumption reduced from 18kg/t DRI to less than 14 kg/t DRI.• RHF consumption reduced from 9kg/t to 1.5kg/t hot rolled coil.

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Conclusion



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In Short

- There must be the will to change (“Burning Platform”)
- There must be a plan
- There must be resources to implement the plan

- Other important factors are :
 - ✓ Stability and reliability is a prerequisite for optimisation efforts.
 - ✓ Management Commitment and Resource allocation essential.
 - ✓ Energy Management System is required to sustain savings and assists with structure

Conclusion (cont.)



- ✓ Measuring and reporting is important for both identifying opportunities and changing behaviour.
- ✓ Awareness and education is a critical part for sustained savings.

- **There are numerous Energy opportunities - many no or low cost opportunities.**

Questions?



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So do what you can where you are and you might be surprised at the result

▪ Thank You