# RESOURCES ORIENTED WASTEWATER TREATMENT: DARVILL CASE

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# Layout

- Traditional wastewater treatment
- Resource oriented approach
- Darvill Case: Nutrients
- Darvill Case: Energy
- Darvill Case: Water
- Conclusion



# Traditional WWT

Basic Process

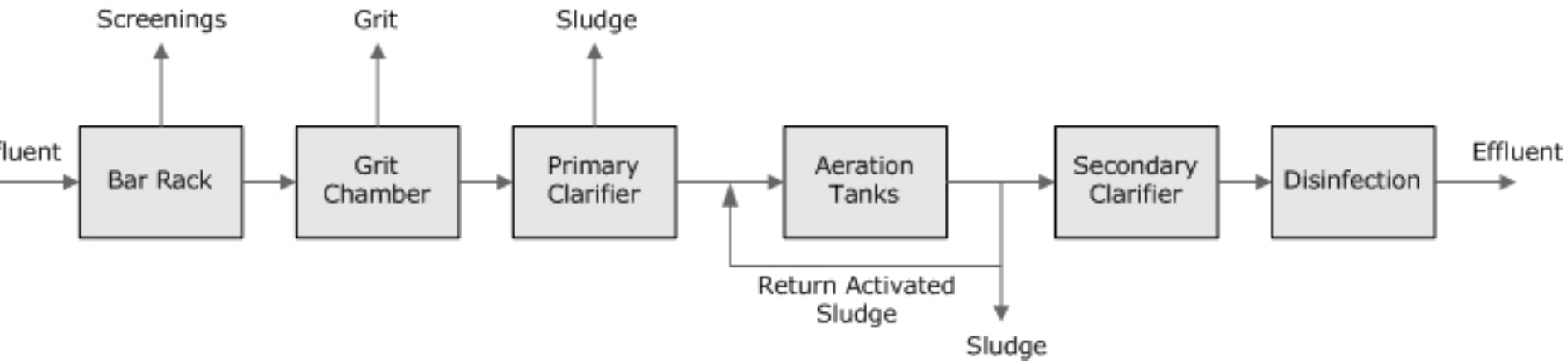
# Traditional WWT

Basic Process → Population Increase



# Traditional WWT

Basic Process → Population Increase → Sophisticated Process



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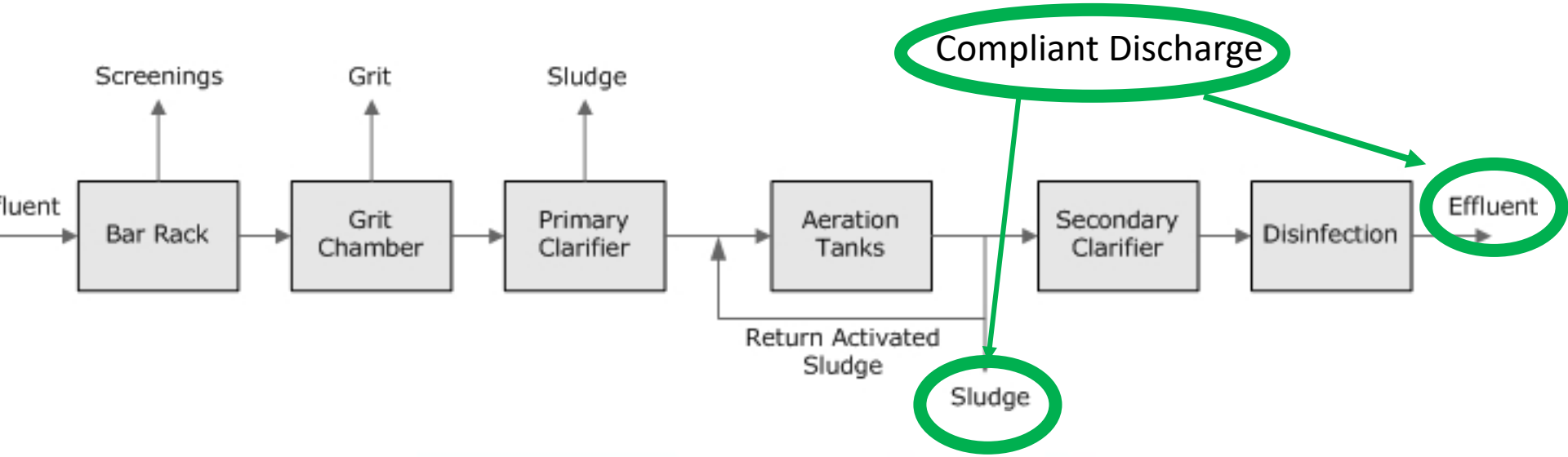

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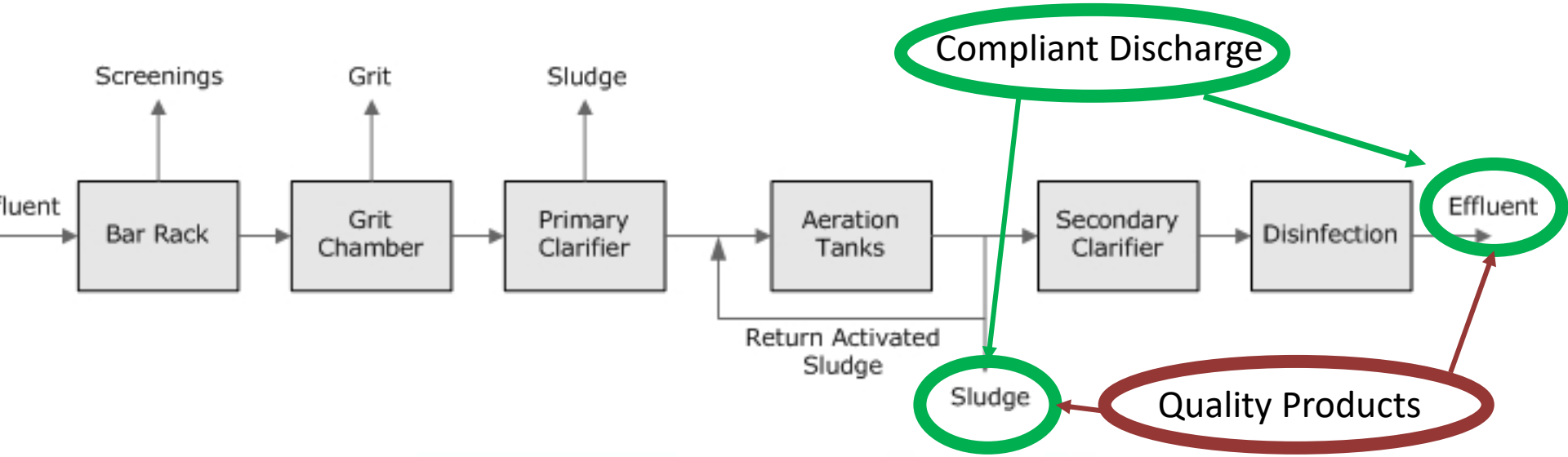


# Resource Oriented

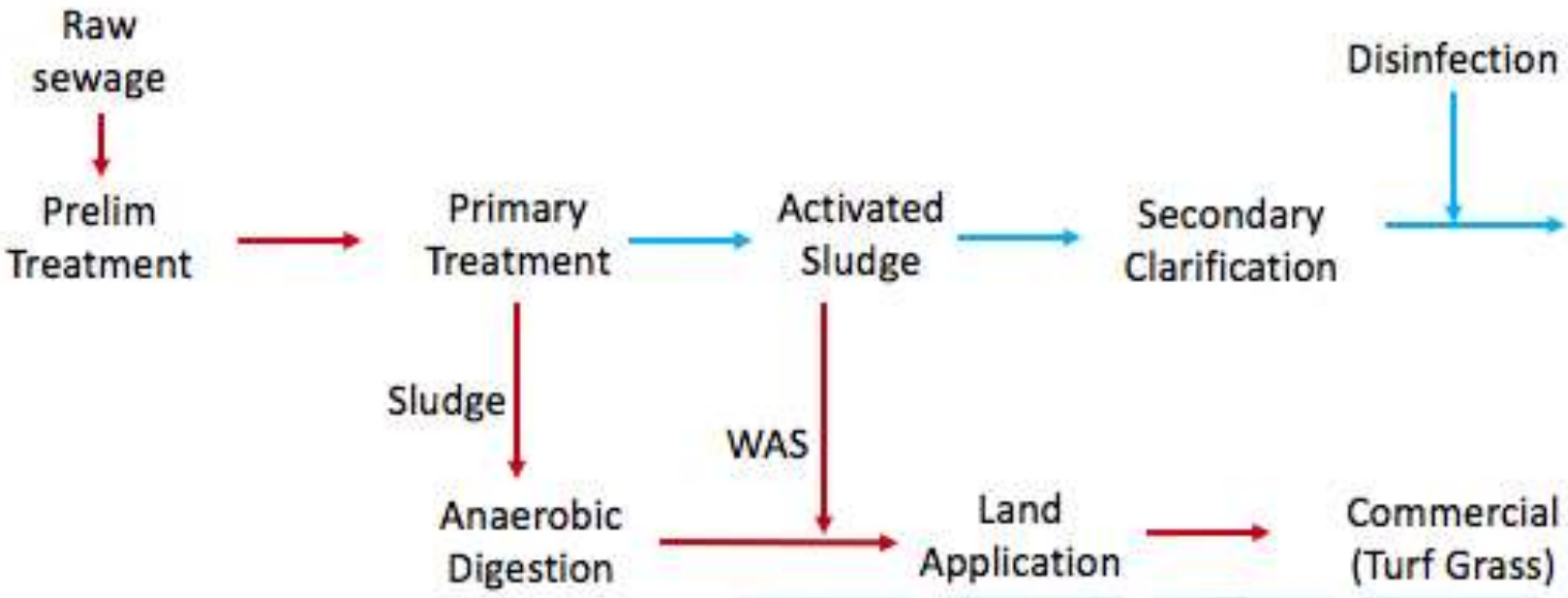
| | |
|---|---|
| Nutrients | • Nitrogen and Phosphorus<br>• Compost (low value – soil conditioner) |
| Organics | • Methane<br>• Energy generation potential |
| Water | • Water scarce country<br>• Drought |



# Darvill Case - Nutrients

Darvill:

- 75 Ml/d wastewater plant in Pietermaritzburg – KZN
- Currently being upgraded to 120 Ml/d



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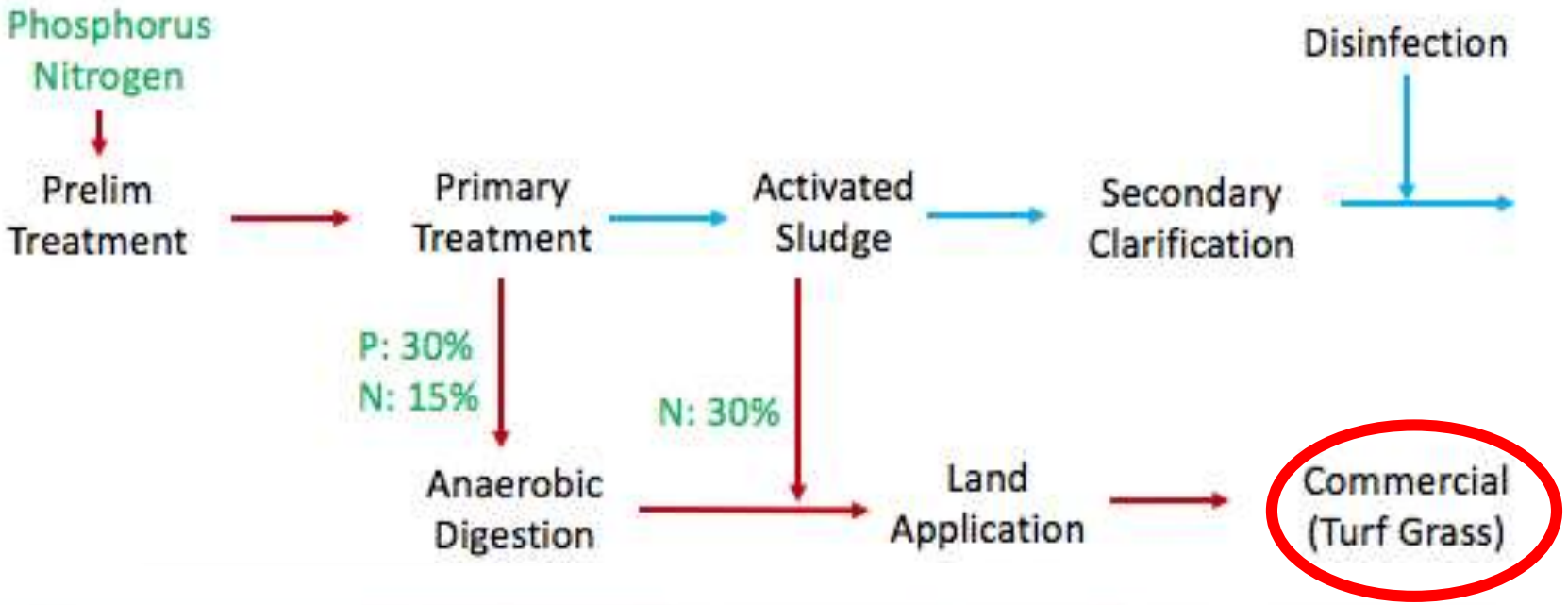

# Darvill Case - Nutrients

1. Sludge irrigated

2. Turf grass harvested

3. Sold as instant lawn

# Darvill Case - Nutrients

- Costs:
  - Irrigation equipment (pumps, sprinklers, etc)
  - Maintenance

- Benefits:
  - Resource efficient sludge management
    - Nutrients reuse
  - ‘Free’ sludge ‘disposal’
  - Environmental protection ‘removal of top soil’

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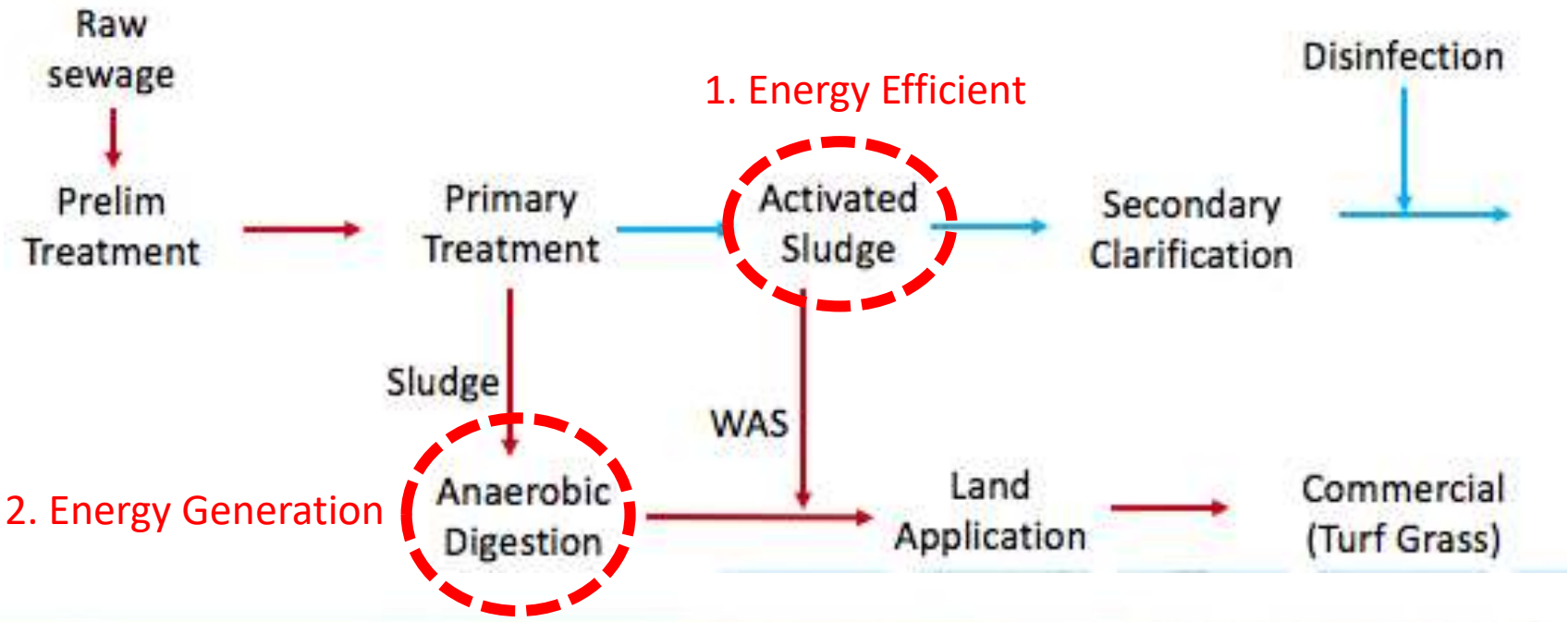
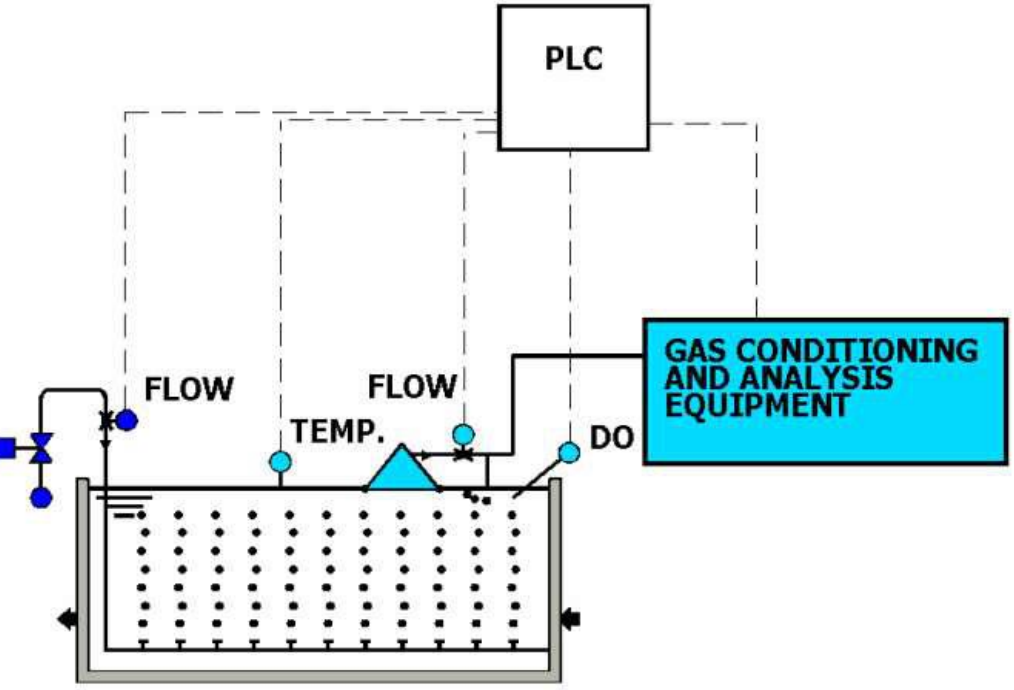


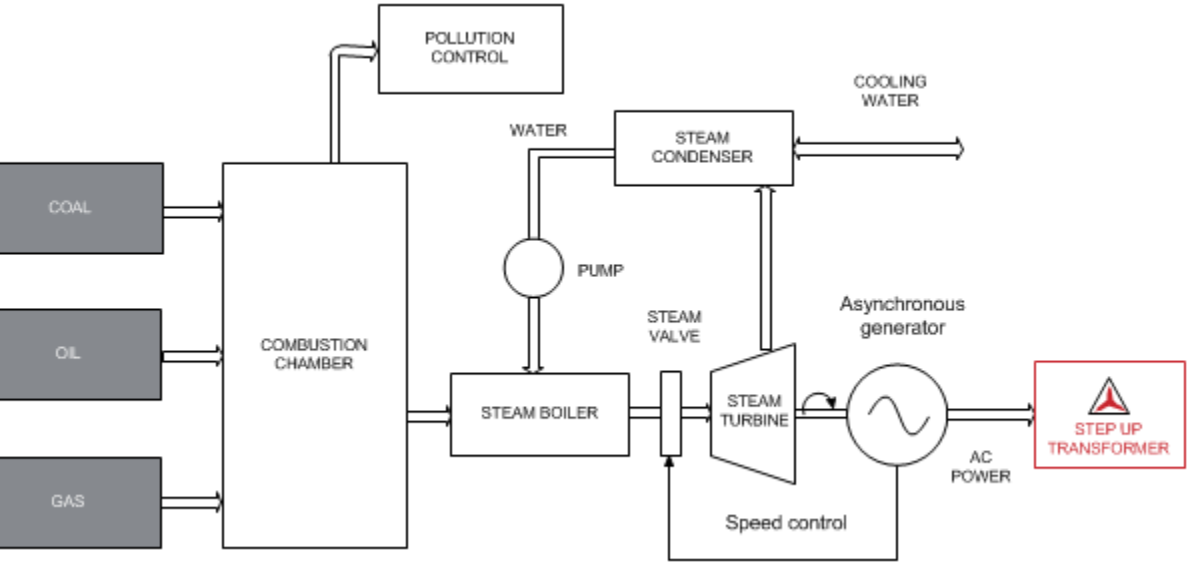
# Darvill Case – Energy

1. Energy Efficient:
   - Alpha meter
   - OTE



# Darvill Case – Energy

2. Energy Generation:
   - 1 MW CHP Plant
   - Procurement
   - Critical load



# Darvill Case – Water

Reclamation plant:

- 2 Ml/d

Unit Processes:

- Coagulation
- Settling
- Rapid gravity filtration
- UF
- BAC/GAC
- AOP ($H_2O_2$ or $O_3$ + UV)
- RO (Space)

1. Social acceptance
2. Process water
3. R&D, CECs, Standardisation



# Darvill Case – Water

Yuck factor:

- DPR Class room
- Already constructed
- Public acceptance
- Normalise reuse
- KZN Water Reuse Chapter

# Proposed way forward

- It’s  a start, long way to go

# Conclusion

Compliant Discharge

# Conclusion

Valuable Product

Darvill WWW to Darvill Production Facility

# Thank you

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