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## STEERING THE FERTILIZER INDUSTRY THROUGH CHALLENGING TIMES

7<sup>th</sup> Edition 6-8 SEPTEMBER, 2016 | DUBAI, UAE

### SYNGAS COMPRESSOR PERFORMANCE IMPROVEMENT BY MAKEUP GAS SUCTION CHILLER INSTALLATION

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# Agenda

- ❑ **Al-Bayroni Company Profile**
- ❑ Background
- ❑ Energy Optimization Project – Major Modifications
- ❑ Syngas Compressor without Suction Chiller Modification
- ❑ Syngas Compressor with Suction Chiller Modification
- ❑ Benefits Summary



# Albayroni Company Profile

Al-Jubail Fertilizer Company (Albayroni) is one of the Agri-Nutrient manufacturing affiliate of SABIC, established in 1979.

**Albayroni is producer of :**

Ammonia : 430,000 MTPA

Urea : 600,000 MTPA

Technical Grade Urea (TGU) : 80,000 MTPA

2-Ethyl Hexanol (2-EH) : 150,000 MTPA

Di-Octyl Phthalate (DOP) : 50,000 MTPA



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Albayroni



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# Background

Al-Bayroni Ammonia plant,

- Originally designed for 1000 MTPD in the year of 1983
- Revamped in the year of 2002 to increase the capacity to 1300 MTPD
- In year 2013, major revamp was carried out to reduce the energy consumption of ammonia plant by 18%

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# Energy Optimization Project – Major Modifications

- **Primary Reformer Furnace Waste Heat Recovery**
- **Major Steam turbines Replacement with efficient designs**
- **CO2 removal system – Hydraulic turbine, LP Flash Column and increased heat recovery**
- **Modified Synthesis loop**
- **Syngas Compressor Suction Chiller**
- **Hydrogen Recovery Unit & Ammonia Purge Gas Scrubber**

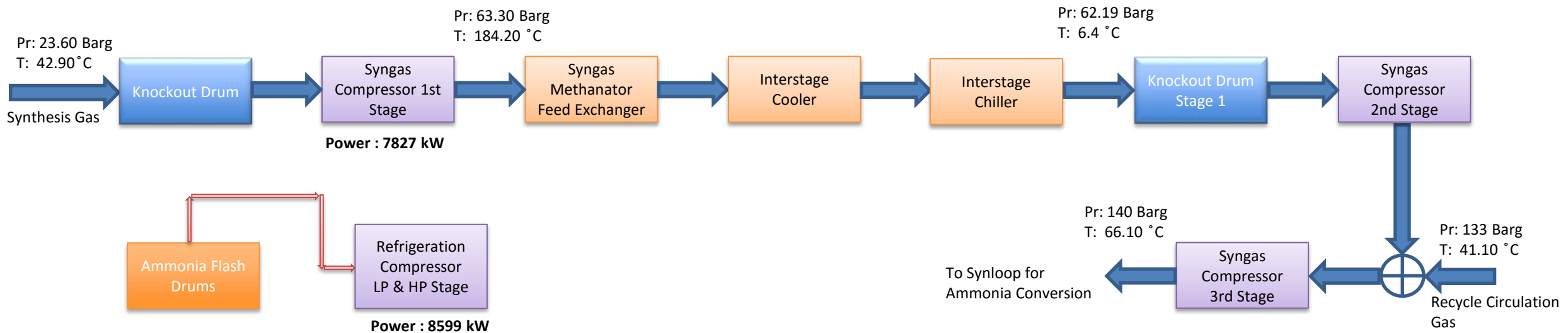
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# Syngas Compressor without suction Chiller

## Syngas Compressor Block Diagram without Suction Chiller Modification:

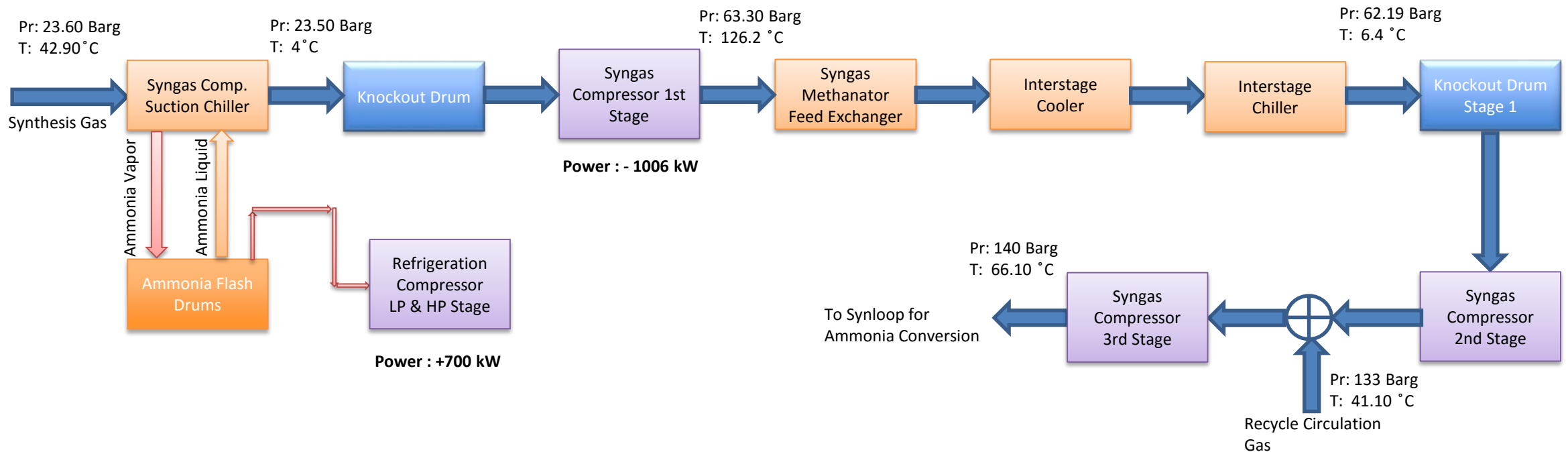


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# Syngas Compressor with suction chiller

## Syngas Compressor Block Diagram with Suction Chiller Modification:



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- ❑ **Benefits Summary**



# Benefits Summary

- **Net Savings of 306 KW in compressor power**
- **Reduced operating speed of syngas compressor from maximum continuous speed of 11000 RPM to 10637 RPM**
- **Refrigeration Compressor was not overloaded by suction chiller duty as duties in other chillers were reduced due to syn loop modifications**



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