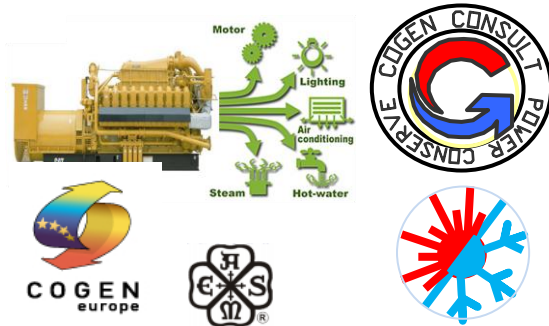


COGEN[®] SYSTEMS

PRODUCE ICE FROM WASTE HEAT

- SALE ICE TO FISHERIES- COLD DRINKS- -ICE DEPOTS - EARN MILLIONS Rs./MONTH



COGEN SYSTEM'S ICE MAKER(BARAF DEPOT) USING ENGINES JACKET & EXHAUST WASTE HEAT & AMMONIA WATER LIQUID ABSORPTION CHILLER

ACHIEVE 80% THERMAL EFFICIENCY AS PER SSGC-SNGPL-IMF-ENERCON EPA PAKISTAN REQUIREMENT & EARN MILLION Rs. PER MONTH PROFIT.

1. Engine's Jacket Waste Heat Driven Ice Making Absorption Chiller
2. European Design With Know how from world leaders "Mattes AG., Germany.
3. Wide refrigeration temperatures from + 5° C to -55° C.
4. Accepts Heat source of More then $\geq 85^{\circ}\text{C}$.(jacket & exhaust Heat).
5. No moving parts, except a robust centrifugal pump.
6. High availability reliability, low maintenance.
7. Fully automatic, Un manned self suffieicnt.
8. No running attention required, fully Automatic.
9. Outdoor / rooftop installation possible.
10. Long life even beyond 25 years.
11. Better Efficiency up to 30% of rated capacity.
12. Ammonia water is Oil-free Refrigerant,
13. No fouling Problems -Eco-friendly,
14. Ammonia water Chiller Complies Montreal Canada Protocol sustainable development initiatives.



**Please Call us for free Discussion - Survey - Energy - Audit - Feasibility
Propospectus Technology Sales of Ice to end users,**

Engr. Khalid saeed

Principal Design Engineer

Cogen Consult

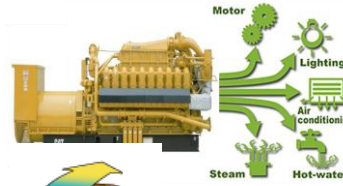
0300 8287009 – E mail: cogenpak@gmail.com.pk,

Address: 111-A/2,3rd. Street,Phase-6,Kh-e-Muhafiz,DHA,Karachi-75500,Pakistan,, Ph-0092-21-35340068, 35340071, Mob-009221-8287009 E-mail:cogenpak@gmail.com,Web:www.cogensys.pk,

COGEN[®] SYSTEMS

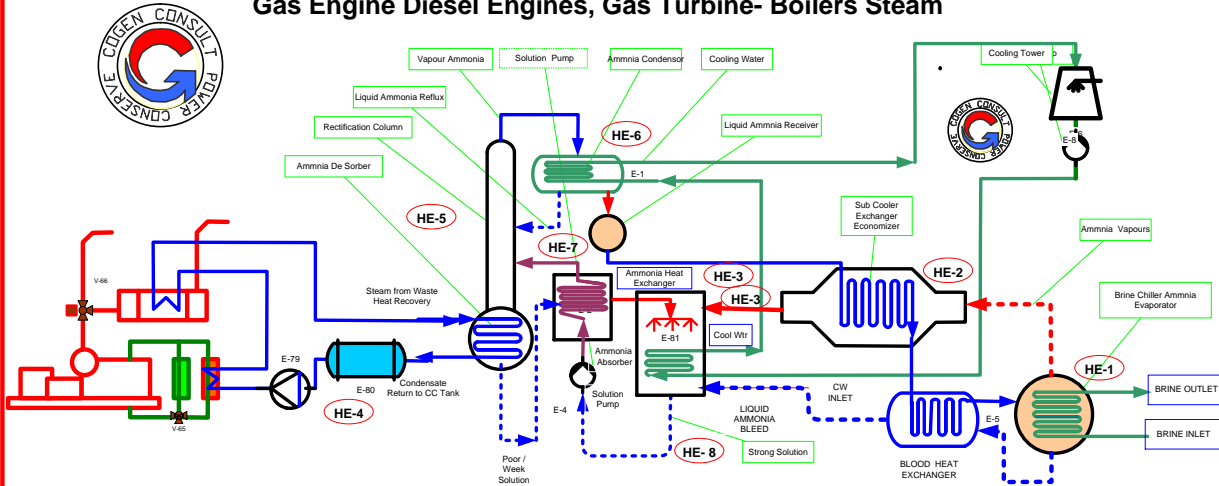
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ICE PRODUCTION USING WASTE HEAT RECOVERY SYSTEM

**Produce ICE from Exhaust Waste Heat
Using Ammonia Water Liquid Absorption Chiller
Gas Engine Diesel Engines, Gas Turbine- Boilers Steam**



OPERATION SEQUENCE - ICE PRODUCTION FROM WASTE HEAT RECOVERY FROM ENGINES GAS TURBINES BOILERS FOUNDRIES STEEL FORGERS EXHAUST
Liquid Ammonia evaporates in the Evaporator (HE1) to give the refrigeration effect. Ammonia vapours from evaporator are used for sub-cooling (HE2) the liquid ammonia supplied to Evaporator. This improves energy efficiency of the plant. Ammonia vapours are absorbed in absorber (HE3). The heat of absorption is removed by cooling water. The strong ammonia solution is pumped to desorber (HE4). Heat is supplied in the desorber to boil off the Ammonia from strong solution. These vapours also contain some water vapours due to affinity between Ammonia and Water. The Ammonia vapours are rectified (Purified) in the Rectifying Column (HE5) and Generate Pure Ammonia vapours. These vapours are condensed (HE6) and liquid ammonia is stored in the receiver (V). The receiver supplies liquid Ammonia to evaporator. Weak ammonia solution in the desorber is sent to absorber for absorption. A solution heat exchanger (HE7) is provided to cool the weak solution before entering the Absorber and Preheat the strong solution before entering the Desorber. This greatly improves of energy efficiency of the plant. The traces of water in the evaporator are bled from Evaporator to absorber through Bleed Heat Exchanger (HE8). Bleed Heat Exchanger further Sub-cools liquid Ammonia and improves efficiency.

WASTE HEAT TO ICE MAKING PLANT -30 C ICE MAKING FROM JACKET & EXHAUST HEAT
COGEN CONSULT
 Mob: 0300-8287009
 cogenpak@gmail.com
 ENGR. KHALID SAEED

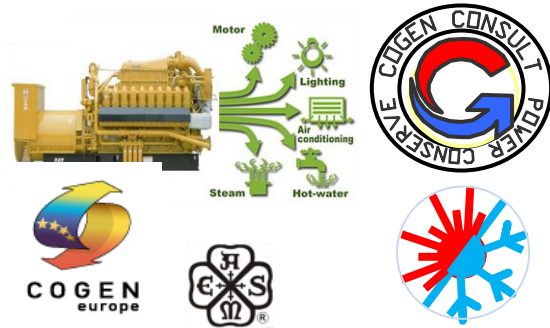


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PRODUCE ICE FROM WASTE HEAT

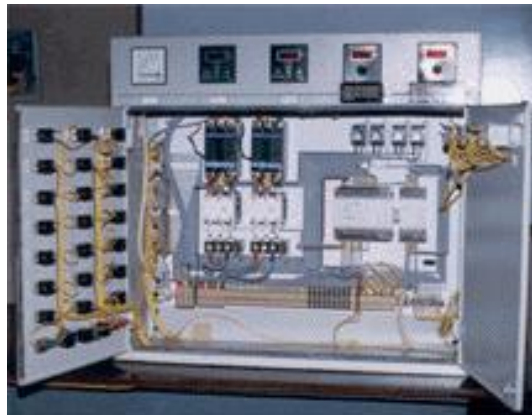
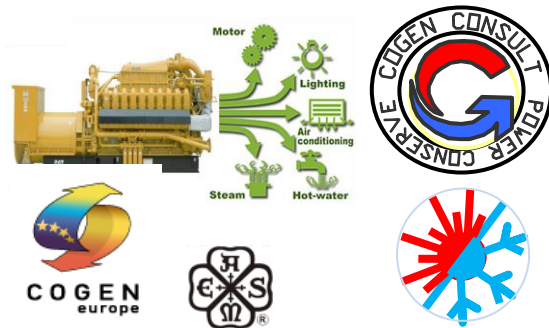
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PRODUCE ICE FROM WASTE HEAT

- SALE ICE TO FISHERIES- COLD DRINKS- -ICE DEPOTS - EARN MILLIONS Rs./MONTH



PRODUCE ICE FROM WASTE HEAT

- SALE ICE TO FISHERIES- PEPSI COLA-ICE DEPOTS - EARN MILLIONS Rs./MONTH

AMMONIA EVAPORATOR COILS IN BRINE WATER TO PRODUCE ICE IN THE CANS.

Absorption Refrigeration process was invented in 1850 by 'Ferdinand P.E. Carre'.

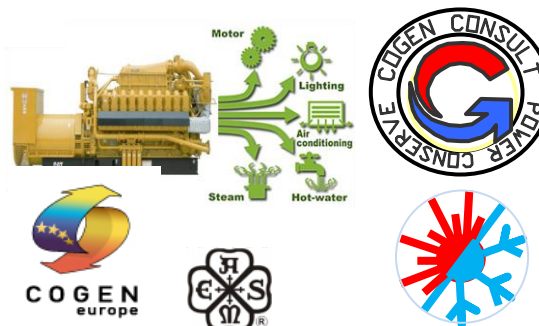
- COGEN SYSTEMS - offers Ammonia Absorption Refrigeration Plants with technology evolved and perfected over 80 years from world leaders Mattes AG., Germany.
- **COGEN SYSTEMS** - ideally fit into the concept of Integrated Energy Systems such as Cogeneration involving Combined generation, Heat refrigeration & Power (CHP) on various fuels like Biomass, LPG, Coal, Natural Gas, HFO etc.

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- **COGEN SYSTEMS** - is the first choice of refrigeration on low cost steam / heat produced from fuels like biomass / coal / heavy fuel oil / natural gas or renewable sources like solar, geothermal etc.
- **COGEN SYSTEMS[®]** - is excellent energy conservation system to convert waste heat into useful refrigeration.
- **COGEN SYSTEMS[®] ICE PLANT** Earns Carbon Credits, reduces CO2 emission tax and promotes sustainable development initiatives through energy conservation.
- **COGEN SYSTEMS[®] ICE PLANT** uses Ammonia which is known to be one of best eco friendly refrigerants.
- **COGEN SYSTEMS[®] ICE PLANT** replaces hazardous ozone depleting CFC Refrigerants.
- **COGEN SYSTEMS[®] ICE PLANT** has wide operating range of +5oC to -55oC.
- **COGEN SYSTEMS[®] ICE PLANT** has extreme reliability and very low maintenance because it has no moving parts except a dependable centrifugal pump.
- **COGEN SYSTEMS[®] ICE PLANT** has long life of atleast 25 years. Many plants are in operation for more than 40 years.
- **COGEN SYSTEMS[®] ICE PLANTS ARE AIR COOLED** are offered in following two types.
 - Type 1—Using Air cooled remote radiators for heat rejection. The heat from cooling water is rejected in Air cooled fan assisted heat exchangers. The condenser and absorber water cooled.
 - Type 2—Ammonia condenser is direct Air Cooled and Absorber is cooled by air cooled remote radiator as in type 1.

Ammonia Absorption Refrigeration Plants the ideal refrigeration Systems.

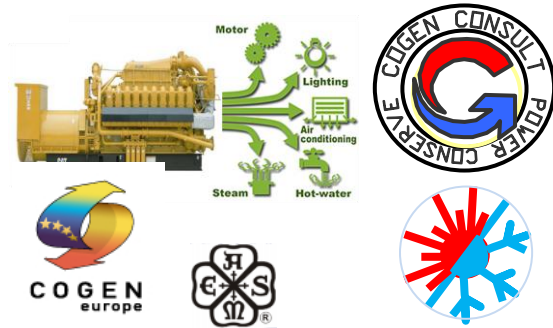
Typical Industrial Applications

GAS GENERATOR & TURBINES	BOILERS WASTE HEAT	
JACKET & EXHAUST WASTE HEAT FROM RECIPROCATING ENGINES,	Waste heat utilization from STEAM BOILERS, FOUNDRIES, GAS TURBINES, STEAM TURBINES.	STEEL MILLS, STEEL FORGERS, HEATERS DRYERS WASTE. GAS TURBINES, STEAM TURBINES.
FOOD & PHARMA	CHEMICAL & PROCESS	
Freeze Drying Food Refrigeration Cold Storages Dairies Ice Making Plants / Ice Storage.	Dairies Ice Cream Plants Meat Processing Fish Processing Industries. Blast Freezing Solvent	/ Ice Storage. Meat Processing Fish Processing Industries. Blast Freezing Solvent

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PRODUCE ICE FROM WASTE HEAT

- SALE ICE TO FISHERIES- PEPSI COLA-ICE DEPOTS - EARN MILLIONS Rs./MONTH