LIFE-CYCLE PERSPECTIVES



Heat recovery and steam assessment

Measure the duty. Compare the options.

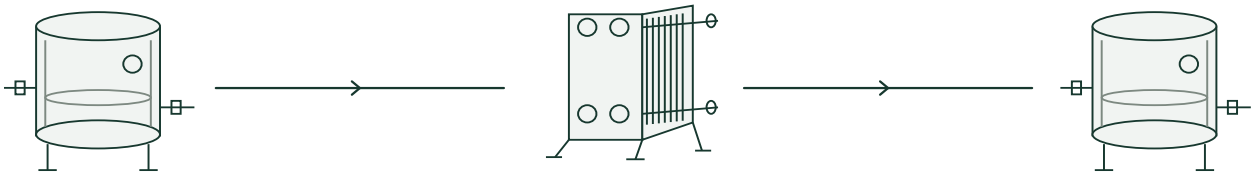
Industrial heat, in context.

Photo / Mitchel Willem Jacob Anneveldt

DIRECT RECOVERY / UPGRADING / STEAM INTEGRATION

Map the heat.
Then choose its destination.

Source temperature and timing determine whether heat can move directly or needs upgrading.



Available warm stream

Measured duty, quality and operating hours

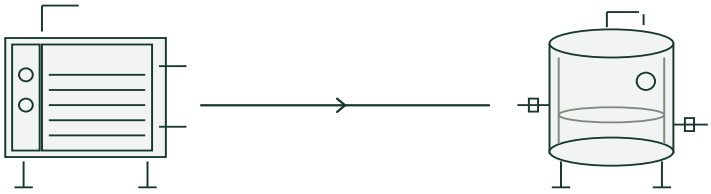
Direct recovery

SonFlow / separate compatible circuits

Receiving duty

Demand temperature and simultaneous load

An alternative source path

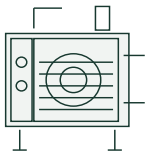


Heat upgrading

Skyven / assessed steam conditions

Steam users

Useful delivered steam; demand profile



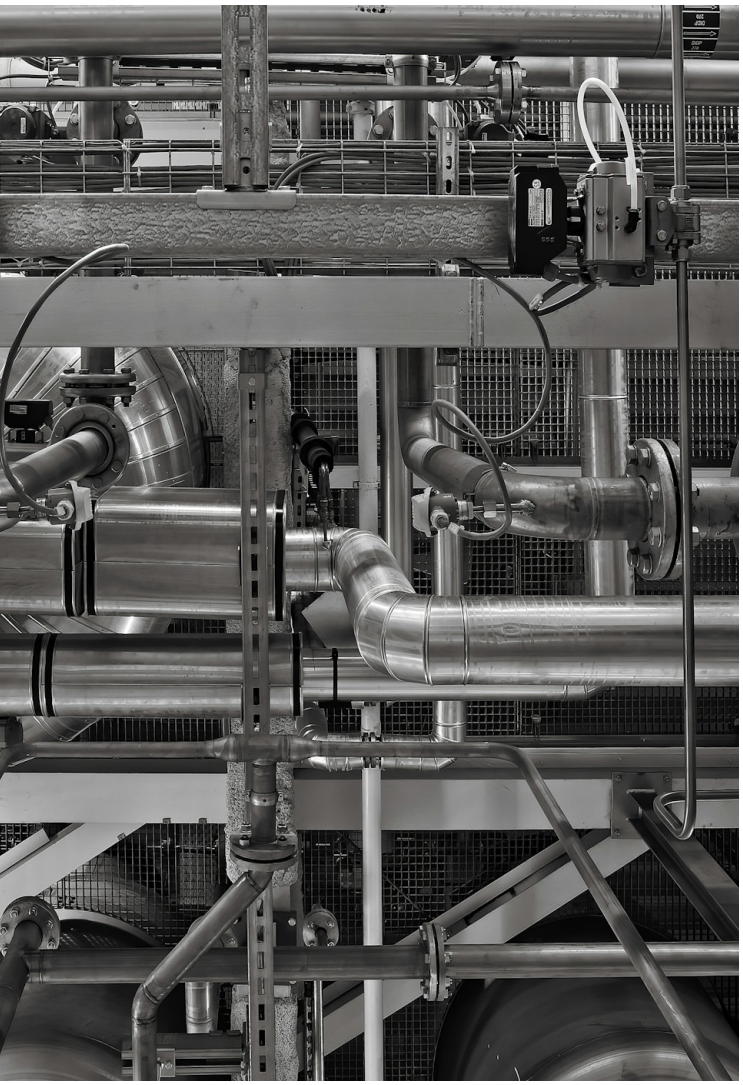
Existing / backup supply

Compare complete systems, including backup, condensate, pumping and controls.

A water-cooled Mehrer compressor is an additional heat-source candidate only after a measured temperature-and-time assessment. No generic saving is assumed.

PROCESS STUDY / 01

Map heat by temperature and time



The utility network.

Photo / Ricardo Gomez Angel

Begin with a schedule of heat sources and receiving duties, not a list of warm machines. For each source, record flow, temperature, heat capacity where relevant, composition and when the heat is available. For each receiver, define its target temperature and demand profile. A process can have substantial waste heat without a matching use. Fouling, allowable pressure loss, circuit separation and maintenance access constrain the recovery arrangement. The photographed pipe network illustrates why the assessment extends beyond a single exchanger: pipe routes, storage and controls determine whether recovered heat reaches a useful duty.

PROCESS STUDY / 02



Assess direct recovery before upgrading heat

A SonFlow plate exchanger can connect a suitable hot source and colder receiver through separated circuits. The available temperature difference limits the outlet conditions and achievable duty. A DanPumps utility pump can support the selected circulation loop after hydraulic review. If the recovered heat is below the required temperature, a heat-pump assessment can examine upgrading it rather than assuming direct recovery is sufficient. Skyven Arcturus is an industrial steam heat-pump option for an appropriately engineered site. Source conditions, electricity, operating hours and integration determine feasibility. Heat recovery and steam generation are distinct duties with different control and equipment boundaries.

Industrial vessels and pipework; utility context

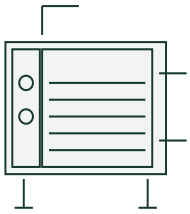
Photo / Crystal Kwok

PROCESS STUDY / 03

Treat steam as a complete network

Evaluate steam production, distribution, use and condensate return together. A useful heat source may come from process condensate, cooling circuits or compressor cooling, but each must be measured and assigned a receiver. A water-cooled Mehrer compressor provides a possible cooling-circuit study; recovering that heat is an engineering proposal, not a guaranteed feature or performance figure for every unit. Pressure levels, steam quality and changing production loads affect integration. Retain the required backup and turndown strategy. An investment comparison should include circulation electricity, maintenance and periods when the recovery equipment cannot operate.

OPERATION STUDY / SELECTED PROCESS DETAILS



Assess steam upgrading

Evaluate heat-pump lift, steam conditions and backup integration.



Compare the scenarios

Apply consistent inventory data and test material assumptions.



Verify operation

Measure installed performance against the defined baseline.

Explanatory equipment studies / configuration, controls and treatment conditions follow the selected product route.

SONFLOW / TRADITIONAL PLATE HEAT EXCHANGER

Recover heat directly

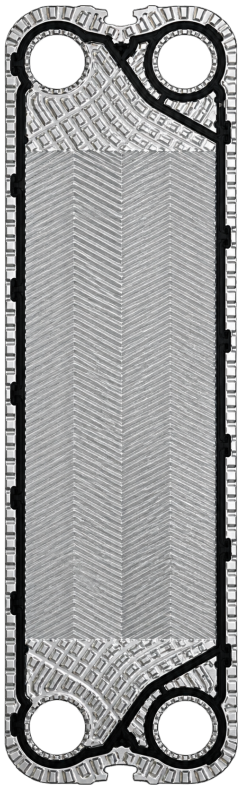


PLATE / FLOW PASSAGE



FRAME / COMPLETE UNIT

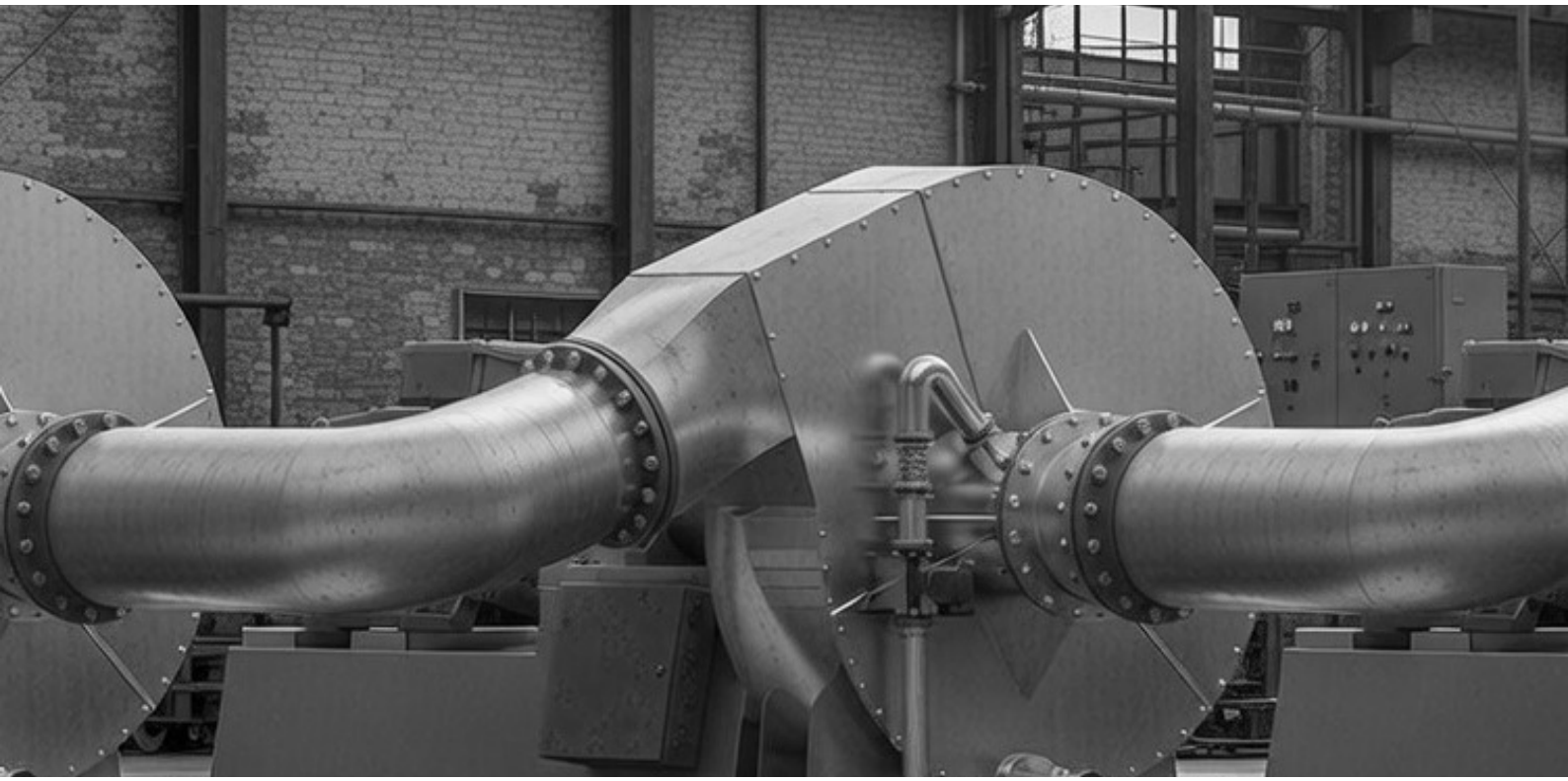
A gasketed plate exchanger is a candidate for compatible liquid-to-liquid duties. Select its area, materials and arrangement from the actual temperature programme and permitted pressure loss. Include pumping requirements when evaluating the complete recovery loop.

Direct-recovery opportunity requiring thermal and hydraulic sizing, fouling allowance and circuit segregation.

EXPLORE SONFLOW /

SKYVEN / ARCTURUS

Evaluate the steam option



SKYVEN / OFFICIAL ARCTURUS PRODUCT VISUAL

Arcturus uses recovered heat and electricity to generate industrial steam. Its site performance depends on heat-source conditions and the required steam pressure. Assess a configuration operating alongside existing boilers, with both energy sources included in the scenario.

Large industrial utility application; project-specific source availability, electricity mix, tariffs and operating schedule are essential.

EXPLORE SKYVEN /

MEHRER / TZW / WATER-COOLED COMPRESSION STUDY

Measure the heat around compression.

The TZW family provides a water-cooled compressor study for the heat inventory. Evaluate the actual cooling-water temperature and timing before proposing recovery into a receiving circuit.



MEHRER / TZW FAMILY STUDY

Heat recovery is a site engineering proposal. No recovery output or performance guarantee is inferred from this illustration. The gas-compression duty still determines compressor selection.

EXPLORE MEHRER /

CONTROL THE PROCESS OUTCOME

Use a consistent baseline.

Measure the same useful heat service before and after a proposed change. Separate delivered heat, fuel input, electricity and rejected heat. Report operating hours and source availability alongside the nominal rating. For carbon assessment, use a documented energy-supply basis and study period; reported reductions follow the documented site scenario. A heat-balance study can support a later LCA but is not equivalent to a completed whole-life impact assessment.

WATCH THE INTERFACES

01 Simultaneous demand and storage

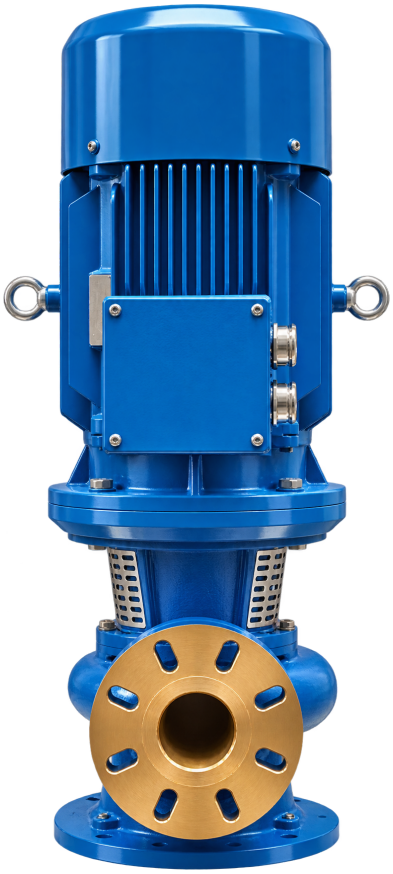
02 Fouling and pressure-loss limits

03 Metered baseline, tariffs and impact boundary

THE AUXILIARY ROUTE

Look beyond one attractive number.

Compare direct recovery, storage, heat upgrading and the existing supply on the same demand profile. Include pumping power, exchanger cleaning, standby operation and utility costs. Test changes in electricity supply and annual utilisation. A higher recovery fraction can require more area or pressure loss, so investigate the system tradeoff. The useful result is a technically achievable operating range with clear assumptions, not a generic percentage saving.



DANPUMPS / S-MP BRONZE-BODY INLINE FAMILY STUDY

A temperature-and-time match permits direct recovery; insufficient temperature may justify heat upgrading. Unmatched heat remains outside the claimed recovery benefit.

EXPLORE THE RELATED EQUIPMENT /

TURN THE ROUTE INTO A USEFUL ENQUIRY

Specify the material. Define the duty.

Supply a measured heat-source profile and a matching demand profile. Include temperatures, flow rates, steam pressure, operating hours and changes between production campaigns. Record the existing boiler or utility arrangement and the energy purchased to deliver the duty. Declare the electricity data and fuel assumptions to be used in the environmental comparison. Evaluate sensitivity to annual utilisation, heat availability and the treatment of standby or backup capacity.

01 Source/receiver temperature profiles

02 Simultaneous demand and storage

03 Fouling and pressure-loss limits

04 Steam pressure and backup strategy

05 Metered baseline, tariffs and impact boundary

RESEARCH BASIS / SELECTED PRIMARY REFERENCES

Screenshot category is Alfa Laval's subscription software; not represented as Lecoqimex software / Goal/scope, inventory, impact assessment and interpretation framework / Environmental LCA covers resources and releases across the declared life cycle / SonFlow / Traditional plate heat exchanger / DanPumps / S-IP/S-MP / Skyven / Arcturus

PHOTOGRAPHIC REFERENCES

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BEGIN THE CONVERSATION

A considered process. A useful conversation.

Tell us about your stream, the operating conditions and the result you want to achieve.

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Heat recovery and steam assessment / Life-cycle perspectives