



Decarbonize Profitably

Empowering strategic climate action

The industrial sector is a major consumer of fossil fuel globally

81

Quadrillion BTU

5.7

Gigatons CO_{2e}

Automotive

73

Quadrillion BTU

5.4

Gigatons CO_{2e}

Industrial

49

Quadrillion BTU

2.7

Gigatons CO_{2e}

Building Heating

Source: IEA, 2018

The fuel is burned to manufacture all that we consume



Fuel for industrial process heat

Industries: Food production, chemicals, textiles, metals, and more

Processes: Both high-temp and low-temp (e.g. smelting steel, pasteurizing milk)

Manufacturers are committing to decarbonize...

Apple commits to be 100 percent carbon neutral for its supply chain and products by 2030



Forbes

Nov 16, 2020, 04:47pm EST | 1,999 views

Wielding \$9 Trillion, Investors Warn Firms From BP To BMW To Get Real On Climate Change

RE100

Over 280 RE100 companies have made a commitment to go '100% renewable'.



THE BIDEN PLAN FOR A CLEAN ENERGY REVOLUTION AND ENVIRONMENTAL JUSTICE

I. ENSURE THE U.S. ACHIEVES A 100% CLEAN ENERGY ECONOMY AND NET-ZERO EMISSIONS NO LATER THAN 2050

The Economist

Meet NextEra, America's most valuable energy firm

THE *Coca-Cola* COMPANY

We are taking action on climate change.



THE RENEWABLE THERMAL ENERGY BUYERS' STATEMENT

1. ACCELERATE COST-EFFECTIVE RENEWABLE THERMAL TECHNOLOGIES



DIAGEO



MARS



But they aren't sure how

Barriers

- **Complexity.** 100's of solutions & no two facilities are alike.
- **Resources.** People & capital tied up running the plant.
- **Overhead.** Time and \$\$ to select and manage third-party resources
- **Risk.** \$Millions at risk if system performs poorly

The business challenge by 2050

An aerial photograph of a large industrial refinery or chemical plant at dusk. The facility is illuminated with warm yellow lights, contrasting with the cool blue tones of the twilight sky. In the foreground, several large, white cylindrical storage tanks are prominent. The background shows a complex network of pipes, distillation columns, and other industrial structures. A semi-transparent white text box is overlaid in the center of the image, containing three bullet points.

- To eliminate 100% GHG emissions
- To be a clean neighbor
- To be equitable, resilient, and growing

OUR MISSION

Decarbonize Thermal Energy in Manufacturing

OUR GOAL

Zero Emissions in Under a Decade

10% CO₂ reduction in the **first year**, minimum

50% in **five years**

100% in **ten years**

Energy projects have historically been painful

Must assemble some combination of:

- Expert consultants
- Reliable equipment vendors
- Reputable EPCs
- Dependable O&M providers

Must fight internal battles:

- For capital
- To get everyone on board (ops, engineering, finance, legal, etc)



**Skyven will take care of all of it, start to finish,
and we contractually guarantee our work**



How we work

Step 1: Options Study

Step 2: Feasibility Study

Step 3: Project Execution

Step 4: O&M and Performance Guarantees

Step 5: Repeat until you reach zero emissions

Options Study

The need

- Lots of point solutions available
- In-depth analysis required to determine which make sense (and when)

The old way

- Time consuming to do the analysis internally
- Underwhelming to hire consultants

The Skyven way

- Our experts utilize digital algorithms and a comprehensive database of solutions to complete the analysis quickly and efficiently

Options Study

Deliverable

- A list of potential projects, including description, estimated benefits, costs, and risks.

What we need from you

- Information on equipment sizes, temperatures, and flow rates (we can pull this info from PFDs, P&IDs, and HMI screenshots)
- Standing 30-minute call every two weeks
- One-day site visit may be required

Our options study is comprehensive

✓ Chillers

Absorption
Desuperheater
Oil Cooler
Compressor heat recovery

✓ Vapor Recompression

Mechanical
Thermal

✓ Separation

Membrane
Reverse osmosis
Heat catalyzed separation

✓ Steam and Boiler System

Blowdown Recovery
Condensate Return
Economizer
Condensing Economizer
Flash Steam
Point of use generation
Combustion air preheat
Recuperator
Waste Heat Boiler

✓ Regen

Clean in Place
Pasteurization

✓ Renewables

Biogas
Biomass
Geothermal
Solar Thermal
Renewable Natural Gas
Renewable Grid Electricity
Renewable Diesel

✓ Combined Heat and Power

Reciprocating Engine
Fuel Cell
Turbine

✓ Drying and Evaporation

Additional Effects
Microwave vacuum
Recovery for pre-heat
Combustion air preheat
Cooling Tower Heat Recovery

✓ Power Generation

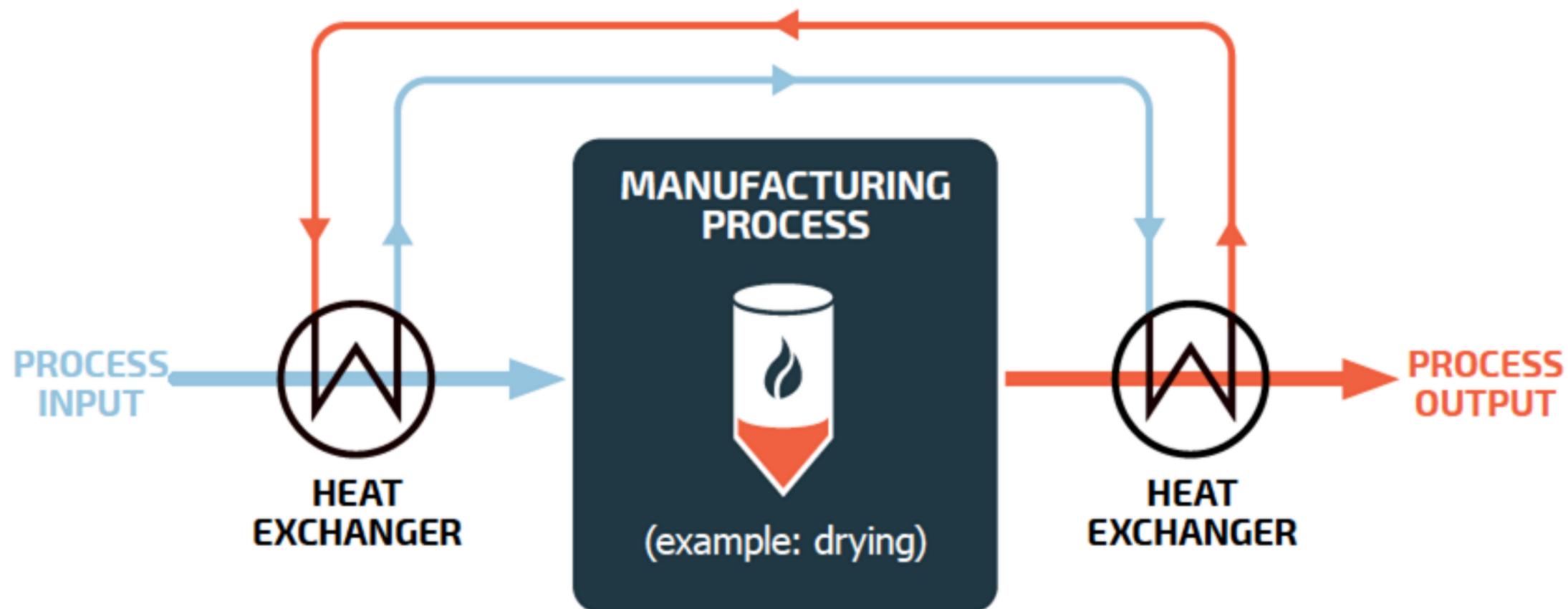
Back Pressure Turbine
Condensate Return
Organic Rankin Cycle

+ carbon capture
+ hydrogen

Avoiding effects on production

We focus on inputs and outputs to a process to avoid affecting the process itself

Conceptual example:



Feasibility Study (i.e. Basic Engineering)

The need

- Once an option is selected, must address feasibility concerns (technical, operational)
- Need more accurate cost estimates in order to move forward

The old way

- Time consuming to find and manage the right engineering firm to do the study
- More time consuming to do it internally

Skyven way

- We'll hire and manage the engineering firm
- We have a network of engineering firms ready and waiting

Feasibility Study (i.e. Basic Engineering)

Deliverables

- Feasibility and basic engineering study (FEL-2) with PFDs, preliminary P&IDs, equipment specs, etc.
- Budgetary cost estimate (+/- 20%)
- Mitigation strategy for any specific risks or feasibility concerns

What we need from you

- Standing 30-minute call every two weeks for updates
- Support engineering firm site visit
- Provide additional information as requested and available

Project Execution, O&M, Guarantees

The need

- Once feasibility is established, the project must be built and maintained
- Internal battles for capital and resources can be fierce

The old way

- Time consuming to find, vet, and manage EPCs and O&M providers
- No performance guarantees; if project does not perform, time and money are lost

Skyven way

- We'll hire and manage all contractors, freeing up your capital projects team
- We offer a no CapEx option, freeing up the capital budget
- We contractually guarantee project performance

Who we are

An experienced team with a combined 100+ years in facilities, energy, and manufacturing

A nationally recognized leader in industrial decarbonization



Backed by distinguished institutions



How you can get involved

Follow us on



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Skyven Technologies



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**SPREAD
THE WORD**

Contact us for more information!

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Pricing

Options Study: typically \$10k

Feasibility Study: 2% of CapEx (e.g. \$20k for a \$1M project)

Project Execution, O&M, Guarantees (two options):

Option A: No CapEx, Savings from Day One

- We cover all capital costs and service costs
- We bill you for the measured and verified benefits delivered by the system (e.g. carbon-free BTUs) at a lower rate than you are paying today (20% savings is typical)
- Guarantee: if the system doesn't provide the benefits, you don't pay

Option B: Traditional Capital Project with Performance Guarantee

- "Cost plus plus". You cover the capital cost of the project plus a 10% one-time admin fee and an ongoing admin fee equal to 20% of the measured and verified benefit
- Guarantee: if the system doesn't provide the benefit, we pay you