

Advancing Sustainable Dairy Processing



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VP of Sustainability and
Member Relations
California Dairies, Inc.

(Moderator)



Joshua Long
President & CEO
E4E Solutions, LLC.



Arun Gupta
CEO
Skyven Technologies



Jacob Outzen Dransfeldt
Sr. Technical Advisor
Consulate General of
Denmark



E4E Solutions - Overview

Josh Long, CEO of E4E Solutions

- B.S. & M.S. Mech. Engineering & M.B.A.
- Founded E4E in 2007
- E4E = Engineered 4 Efficiency

E4E Solutions Overview

- We cater to the Manufacturing market, primarily Food & Beverage (incl. Dairy)
- An MEP firm focused on energy efficiency and decarbonization project delivery
- We help the market leaders develop a sustainability Road Map, with ROIC optimization by providing Consulting, Design Engineering, & Construction Delivery, with optional financing
- Our Team is comprised of licensed PE's, CEM's, PMP's and support staff
- We are Utility System Modernization and Decarbonization Capital Delivery Solution Experts

E4E'S FOOD & BEVERAGE CLIENTS



Manufacturing Markets Served



Food & Beverage



Pharma/Med Devices



Metals



Glass



Automotive



Pulp & Paper



Chemicals



www.E4ESolutions.com



Dairy Processors - CO2e Reduction Potential

- **10%–30%** Low Hanging Fruit & Best Practice Upgrades
 - Utility Systems modernized w/ energy efficiency measures
 - Automation and Controls used to anchor optimization
 - Assets are maintained, operated right, and only when needed
- **10%-50%** Process redesign & Heat Recovery Integration
 - Heat Pumping to electrify process thermal energy needs
 - Waste Heat is recovered and integrated back into process
 - Best in class process equipment, process control, & CIP Ops
 - Eliminate Fossil Fuel use or convert to bio-mass fuel / RNG
- **To 100%** - Renewable Power Supply Conversion
 - Multiple approaches, typically adds cost, if available



WANT TO TALK TO E4E?

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VP of Business Development

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DECARBONIZE PROFITABLY

Arun Gupta
Founder & CEO
Skyven Technologies



ALIGN

our financial goals with your
emissions reduction.

+

FUND

the project with no capital
expenditure.





SKYVEN ARCTURUS STEAM-GENERATING HEAT PUMPS

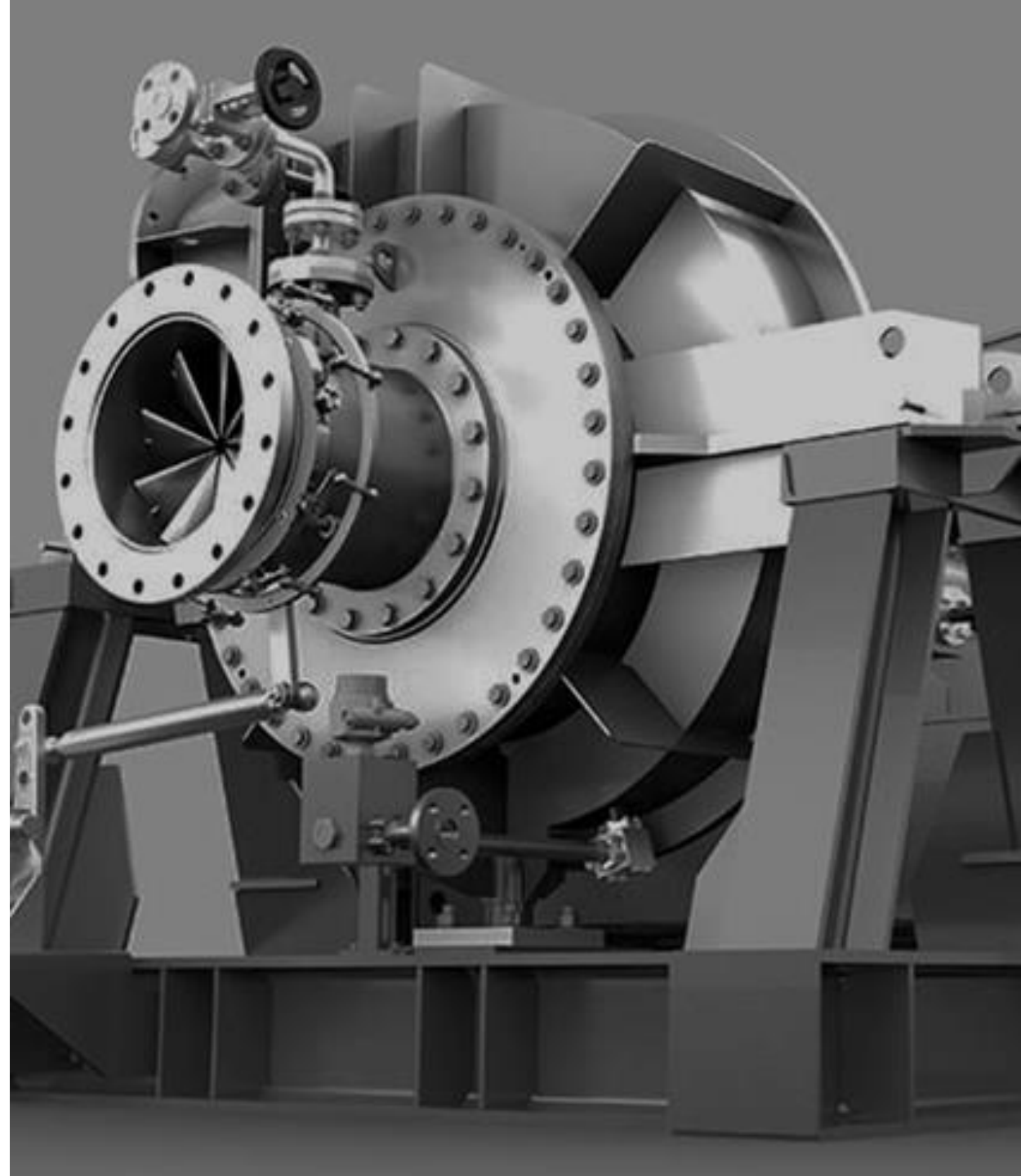
Generates high-quality steam at up to 400° F (290 psig)

Sources heat from cooling return at 80°-90° F

Uses 60% less electricity than electric boilers

Backed-up by existing boilers and cooling towers

Built on highly reliable MVR technology





Thank You

Arun Gupta
Founder, CEO
Agupta@skyven.co



**MINISTRY OF FOREIGN AFFAIRS
OF DENMARK**
The Trade Council

SUSTAINABLE INDUSTRY ALLIANCE

**California Creamery Operators association, South Lake Tahoe, June
2023**



Agenda

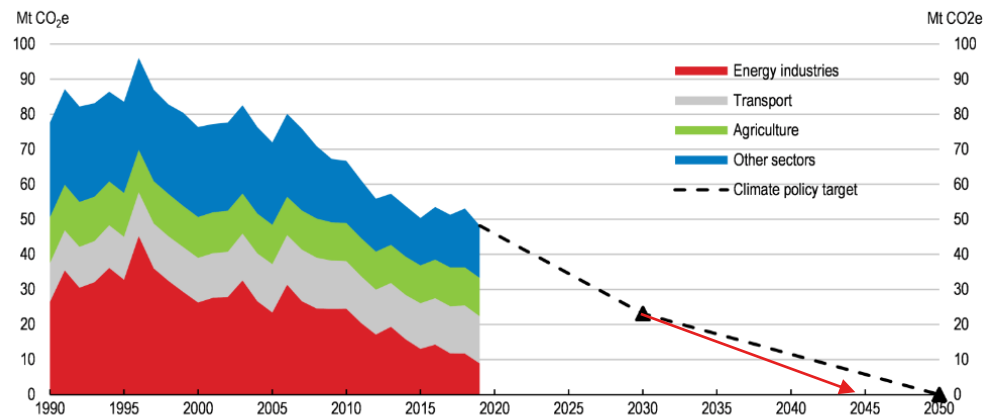
- **Background and purpose**
 - Climate mission and EE-story
- **Approach to energy efficiency**
 - Initial studies
 - Sub-optimization and holistic approach to EE
- **Collaborative approach**
 - Value program
 - Invite to inspiration and call for collaboration



Denmark's climate mission



Figure 1. Meeting targets will require further progress in all sectors



Source: UNFCCC GHG Data Interface; Danish Climate Law.

SMALL COUNTRY – LARGE AMBITIONS

Goal to lower GHG-emissions by:

- 70% in 2030 (Joint climate act)*
- 100% in 2045 (net-zero)**
- 110% in 2050 (carbon-negative)**

*Compared to 1990 level.

** Latest government scheme.

100% renewable electricity by 2030

Responsible for 0.1% of total global emissions => greater impact in global collaboration.

THE DANISH STORY OF ENERGY EFFICIENCY

Since oil crises in the 1970s => increased political focus on energy efficiency and resource optimization.

Political initiatives:

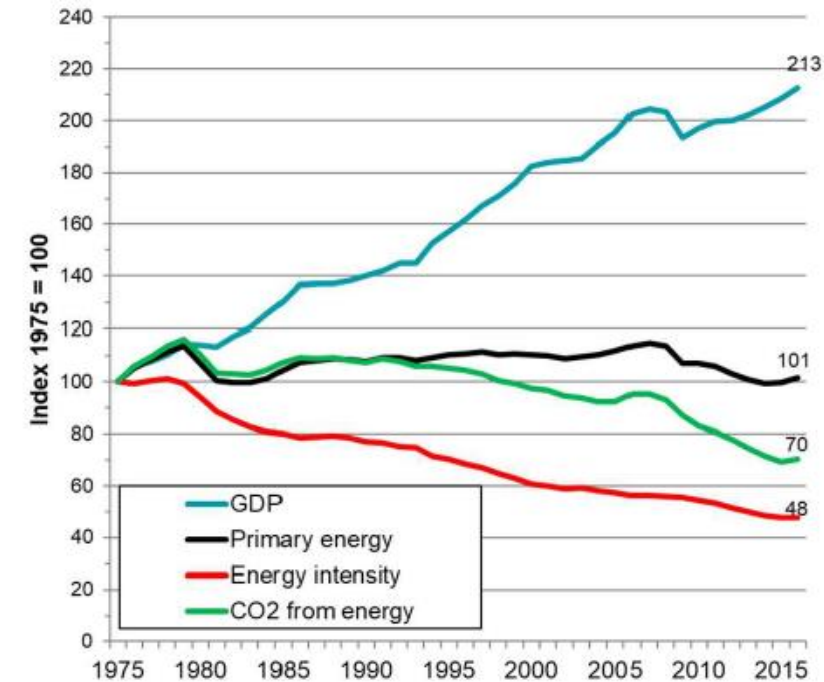
- Energy & CO₂ taxes (increased incentive).
- Subsidies & grants programs (increased incentive).
- Energy efficiency obligations.
- Research & development.

We've learned to use high energy prices as business advantage -

- From a business perspective, could keep this secret
- From a global perspective, rather inspire and give access to relevant technology and knowledge sharing.

High energy prices incentivizes the industry => innovative technology and holistic approach to energy efficiency.

Electricity prices (including taxes) for household consumers, first half 2022



Graph: Decoupling energy usage from GDP* + transition to renewable energy.
*GDP= Gross Domestic Products.

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differentiated approach to energy efficiency

Initial studies - Learnings and where the efforts are headed

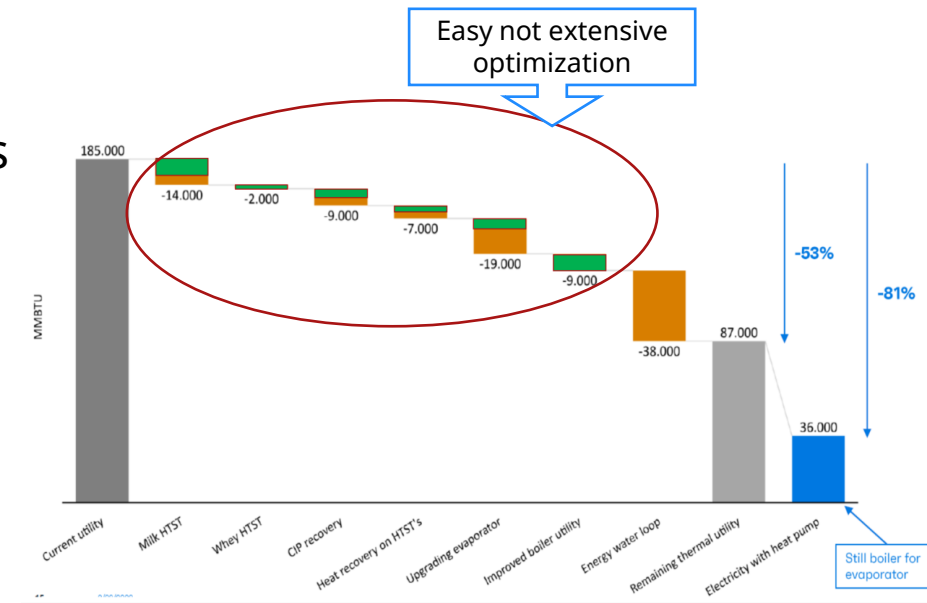
In-depth study with CEC and energy and water audits across states from last 4 years. – reveals good news.

Sub-optimization

Easy to implement, well-proven solutions ready to help you **reach the first 15-40% of your savings goals:**

- Optimizing boilers
- Heating systems
- Cooling systems
- Compressed air
- Changing existing boilers to heat pump
- Control systems
- Sub-meter management systems
- ...and more

With stacked federal, state and utility incentives
– **ROI from 3-5 years, down to months.**



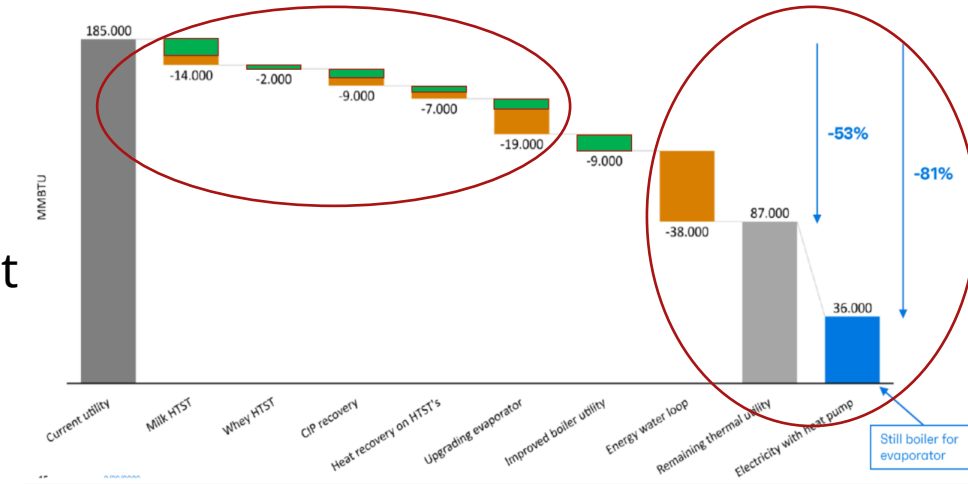
differentiated approach to energy efficiency

Ready to take it further?

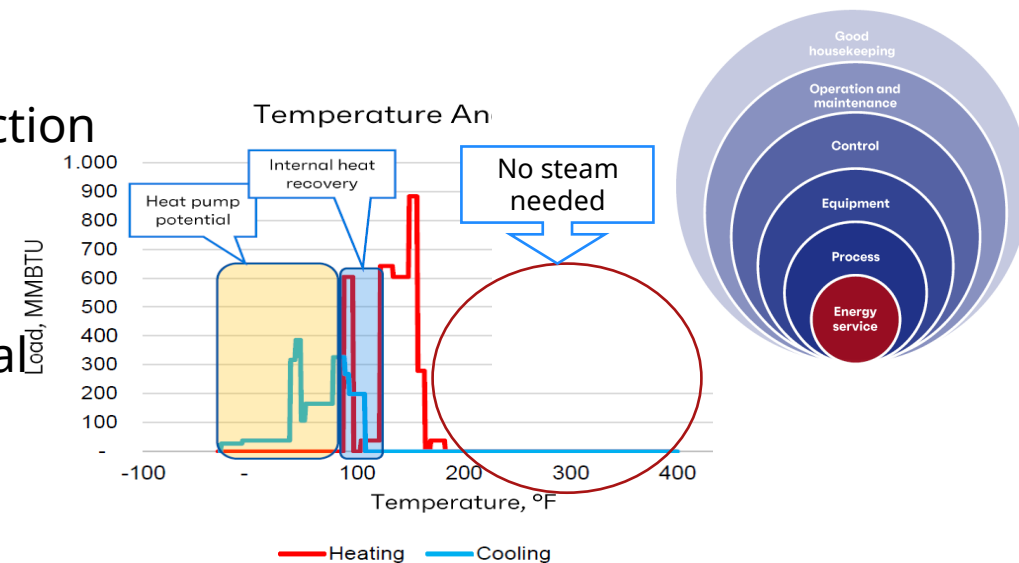
Holistic approach, to **achieve 40-80% energy savings.**

- even 100% fossil-free and water-neutral production:

- “Inside out approach” New approach to analysis and coherent consumption
- Utilize surplus- and excess heat & cooling (internal energy loop)
- Adapt heating and cooling systems to actual needs (steam most often not needed).
- Heat pumps or cooling towers (blowing out energy)
- Control system communicating across and aligning production planning – incl. energy and resource optimization
- From waste water to energy resource (tempered water, bioenergy, fertilizers, water reuse, “technical water” etc.)



The “inside-out” approach...



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Value program:

Free-of-charge **ENERGY & WATER SCREENINGS** conducted by SIA's technical advisor.

Funding for comprehensive **ENERGY & WATER AUDITS** conducted by Danish consulting engineers.

Invitations to **knowledge-sharing meetings** and special events, e.g. a **fact-finding tour** to Denmark.

Assistance in **identifying funding opportunities** for new upgrade projects.

Collaborative approach to W&E efficiency

Well-tested solutions ready to help you reach the first 15-40% of your savings goals:

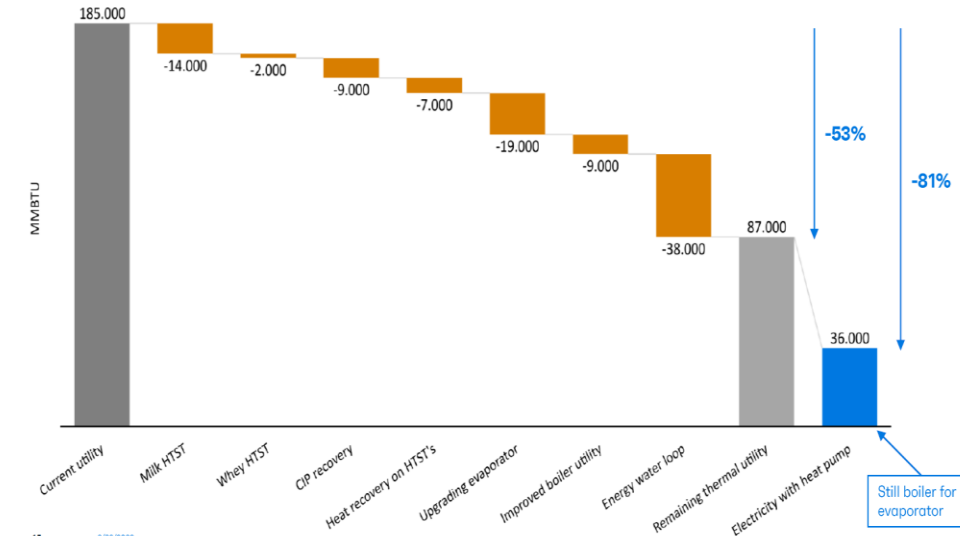
Go further to achieve 40-80% energy savings. - even 100% fossil-free and water-neutral production

We seek to inspire, support and collaborate.

- Seeking companies for a strategic collaboration
Prove sustainable production is good business on several levels.

Fact finding tour, October 2023

Interested in being inspired and gaining first-hand knowledge from European peers - Fact finding tour, October 2023



An aerial, high-angle shot of a long cable-stayed bridge stretching across a vast body of water. The bridge's two main towers are prominent, with numerous stay cables fanning out to support the deck. The sun is low on the horizon, creating a warm, golden glow that reflects on the water and illuminates the sky with soft, wispy clouds. The perspective is from directly above the bridge, looking down its length towards the horizon.

Thank you - Lets connect

Jacob Dransfeldt - Sr. Technical advisor
TC-Denmark – Sustainable Industry Alliance

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