

Solar POWERED ICE MAKER

FUTURE of ICE MAKING IN INDONESIA

Iwan Chandra | AIREF | 12 Oct 2023



PT SELARAS MANDIRI TEHNIK

Jl. Raya gunung gangsir, Beji – Pasuruan, EAST JAWA, INDONESIA



OUR PRODUCTS

Air cooled Condenser

Evaporator

Dry Cooler

Condensing Unit &
Multirack Compressors

Cold Storage System, ABF

Ice Machine





**EMERSON
CONDENSING UNIT**

- Performance 2HP - 20HP
- Wide operating envelope
- Efficient and quiet
- Low applied cost
- Simple and reliable



ICE FLAKE

Capacity : 0.5 tons to 10 tons/day.



**AIREF
CONDENSING UNIT**

- 5HP to 50HP
- Reliable performance
- Wide operating envelope



AK/AT SERIES

THE BUNDLE SOLUTION

Chiller and Freezer room with
smart cooling intelligence
Room size : 15 to 1000 m³
Room Temp : 5°C to -25°C



**MULTI RACK
COMPRESSOR**

For bigger cooling capacity
with multiple cooling points.



ICE SLURRY

Capacity : 1 tons to 10 tons/day.



Problem: Indonesia: 100,000 km coastline, increasing fish production, growing cold demand, fish spoilage

Question: how to extend the cold chain to remote areas and create additional incomes locally?

Nasib Nelayan Wasileo, Sulit Es Tuna pun Rusak

oleh Mahmud Ichi [Ternate] di 23 April 2020



Higher added value on fish and improved market access will lead to higher incomes for local fishermen.

Nelayan mengubur tuna yang rusak karena kurang es. Foto: dokumen nelayan

SOLAR POWERED ICE MAKER



Oleh Miftah Ardhan
5 Juli 2016, 13:00



ARIEF KAMALUDIN | KATADATA

Pemerintah tengah fokus membangun pembangkit listrik di berbagai daerah, khususnya di Indonesia bagian timur, yang memang masih banyak belum mendapat pasokan listrik.

- The cooling sector is the **fastest growing energy sector** in Indonesia (↑ energy demand). Indonesia's Eastern provinces face energy shortages and lack of infrastructure. **Today's cooling solutions** rely on outdated and inefficient technology, leading to **high costs**. Expensive Diesel generators are the common choice.

SOLAR POWERED ICE MAKER



PV Solar-Powered Ice Machine

Think global, Act local. Indonesia's solution for connecting the cold chain to the first mile with 100% Greenhouse-Gas Emission-Free Cooling

Be Bright,
turn to
Solar Power



- Solar irradiation represents one of Indonesia's largest sources of energy. **Solar PV** is a **highly cost-competitive** and reliably technology for electricity generation

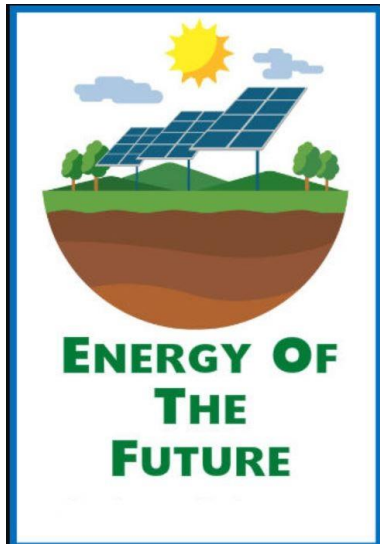
Targets:

- **Access to the cold-chain / access to markets leading to an increase in productivity for fishers**
- **Reduction of post-harvest losses**
- **New manufacturing & production capacities in Indonesia.**

► The Idea Behind

The FUTURE of ICE MAKING in INDONESIA

- 100% powers by **RENEWABLE ENERGY**



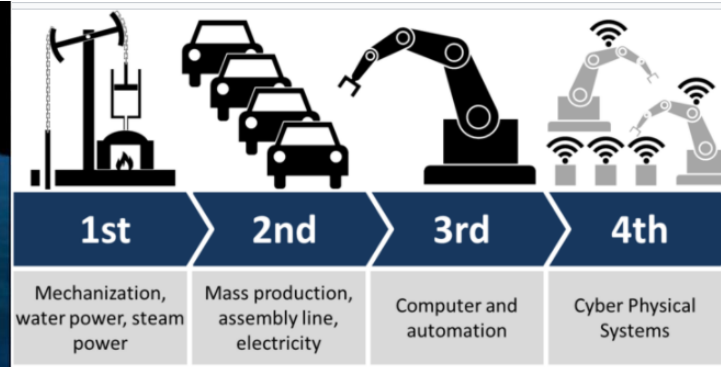
- 100% greenhouse gas emission free, running on **natural refrigerant** with minimal impact to global warming.



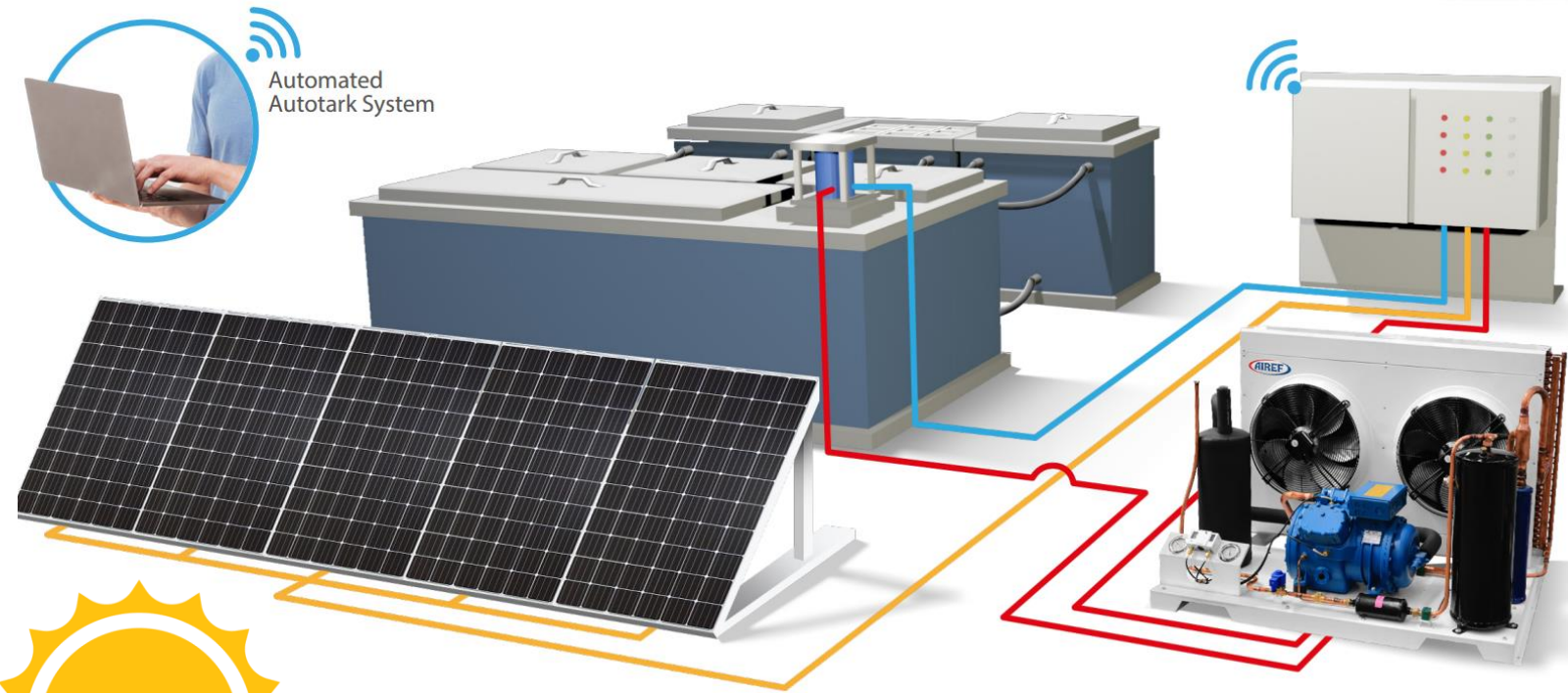
► The Idea Behind

The FUTURE of ICE MAKING in INDONESIA

- 100% **energy self-sufficient**, Independent from external power supply, only requires fresh water
- Automated **4.0 technology** with dynamic operation : Ice generation synchronous to sunshine, remote control access and monitoring
- **No fuel needed**, cheaper than Diesel.



SOLAR POWERED ICE MAKER



DYNAMIC ICE MAKING

Refrigerant

A PV-Solar Plant Ice Machine is using propane R290 refrigeration. R290 capable of high performing, excellent thermodynamic performance and very low global warming potential.



Business Model

POWERED SOLAR ICE MAKER

OFF GRID, SOLAR PV Variable ice production

- Up to 1.2 tons per day (>50% of the year)
- 245 tons block ice per year (*estimation)
- 100% renewable / 100 % independent

ICE SALES / Ice production based on Solar PV in areas without grid electricity

Revenue / earnings from ice production

- ✓ Ice price : Rp 1,500,- / Kg
- ✓ Rp 367 juta yearly revenue
- ✓ Rp 267 juta yearly operating profit

+

Opportunity vs. old technologies powered from Diesel

- ✓ Avoiding 14,290 liters of Diesel fuel per year
- ✓ Avoiding 40 tons of CO₂ per year
- ✓ Savings of 143 juta IDR yearly



PAYBACK
4 Year

FISHER COOPERATIVE / fish on ice where cooling solutions were not available

Higher quality of fish = higher market price

- ✓ Additional value for fish on ice : Rp.4000,- / Kg Fish
- ✓ Rp. 980 juta yearly added value
- ✓ Rp. 889 juta yearly operating profit

- Preventing food spoilage in areas without stable electricity access → min. 245 tons of fish per year (1:1)
- Providing market access and additional income for smallholders



PAYBACK
2 Year

SOLAR POWERED ICE MAKER, SIM-1200 INSTALLED IN SULAMU, KUPANG – NTT.



SOLAR POWERED ICE MAKER



THANK YOU

