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Florida Energy Profile – a model for Economic Development

HTH FULL SPECTRUM AQUACULTURE

Fort Pierce, May 16 2024

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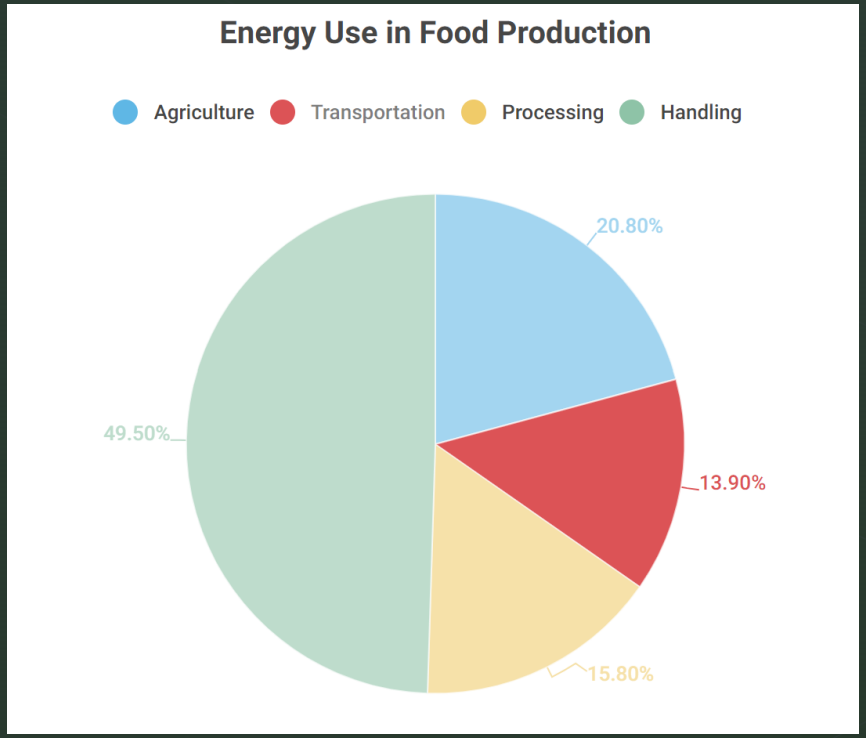
THE IMPORTANCE OF ENERGY

Energy plays a vital role in food production around the world.

About **30%** of global energy is consumed in the agricultural and food sector.



THE IMPORTANCE OF ENERGY IN AQUACULTURE

- High energy requirement is a challenge which increases operational costs
- Representes 10% of total production costs
- Poorly design systems can be 20% or more
- Environmental, social, and economical sustainability involved
- Energy source to be employed in a farm will be dictated by the system’s location and accessibility to the energy sources, e.g. electricity, natural gas, propane
- Location of aquaculture operations, sometimes in remote areas, may make it easier to justify use of renewable energy than in other industries

RAS COMPANIES AROUND THE WORLD – US RANKS FIRST

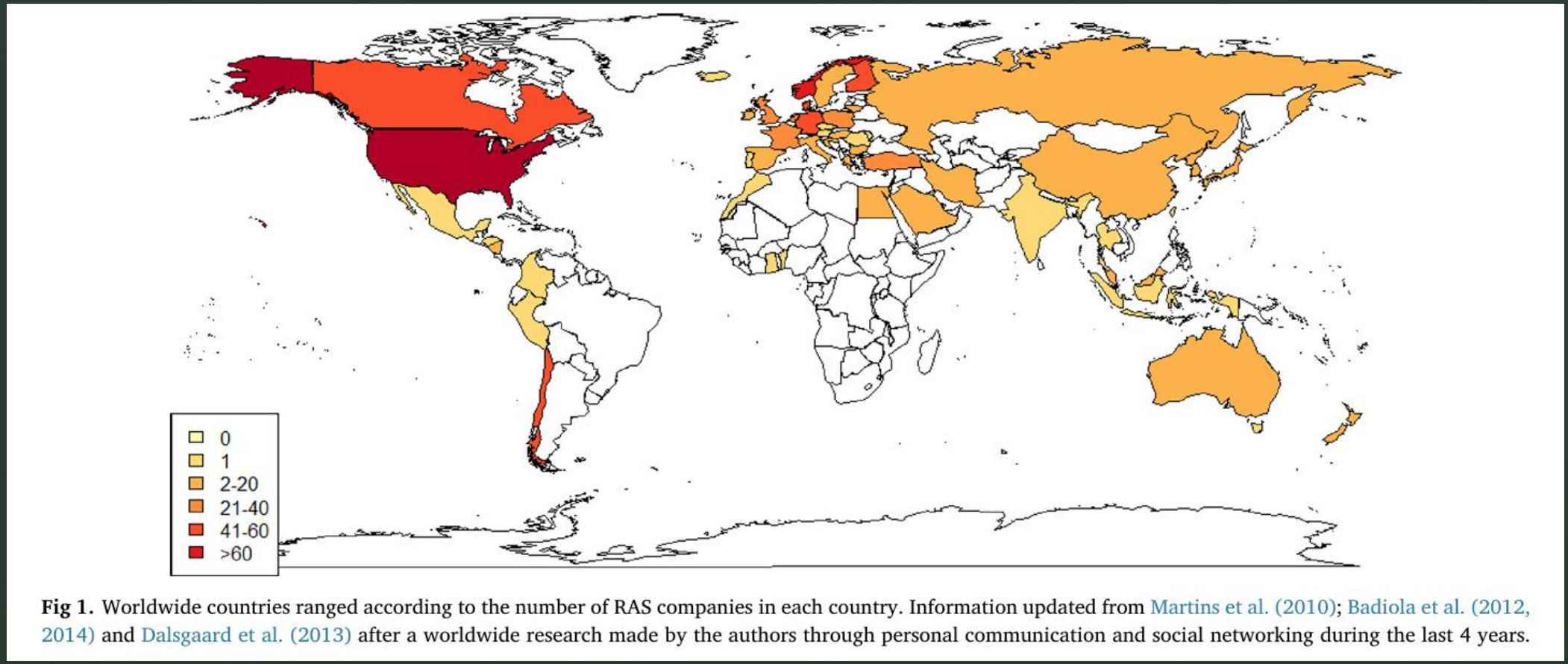
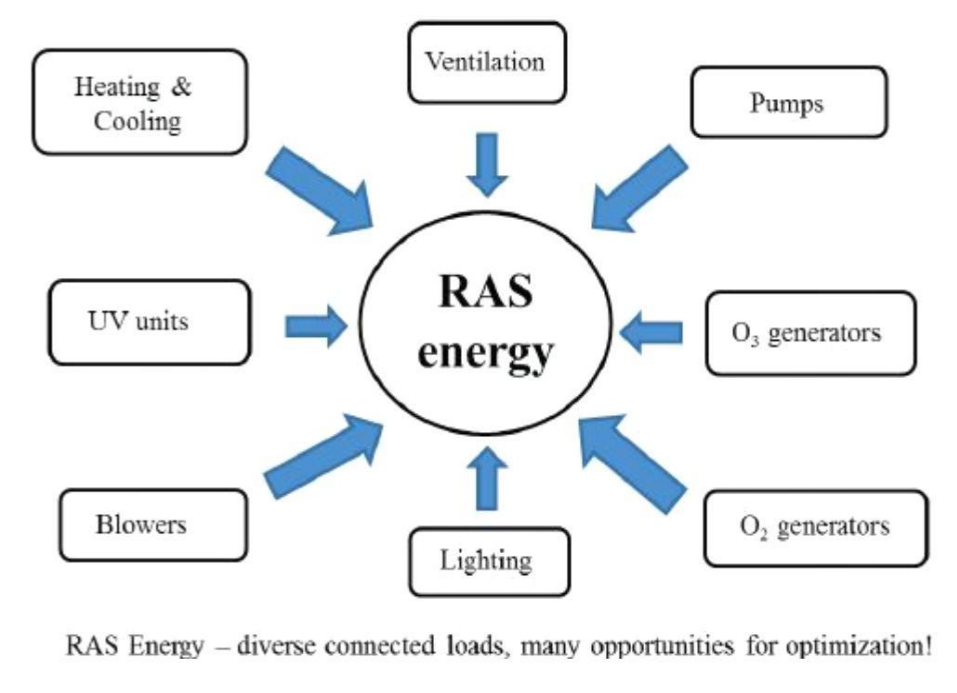


Fig 1. Worldwide countries ranged according to the number of RAS companies in each country. Information updated from Martins et al. (2010); Badiola et al. (2012, 2014) and Dalsgaard et al. (2013) after a worldwide research made by the authors through personal communication and social networking during the last 4 years.

WHERE IS e-USED?

Indoor systems energy requirement

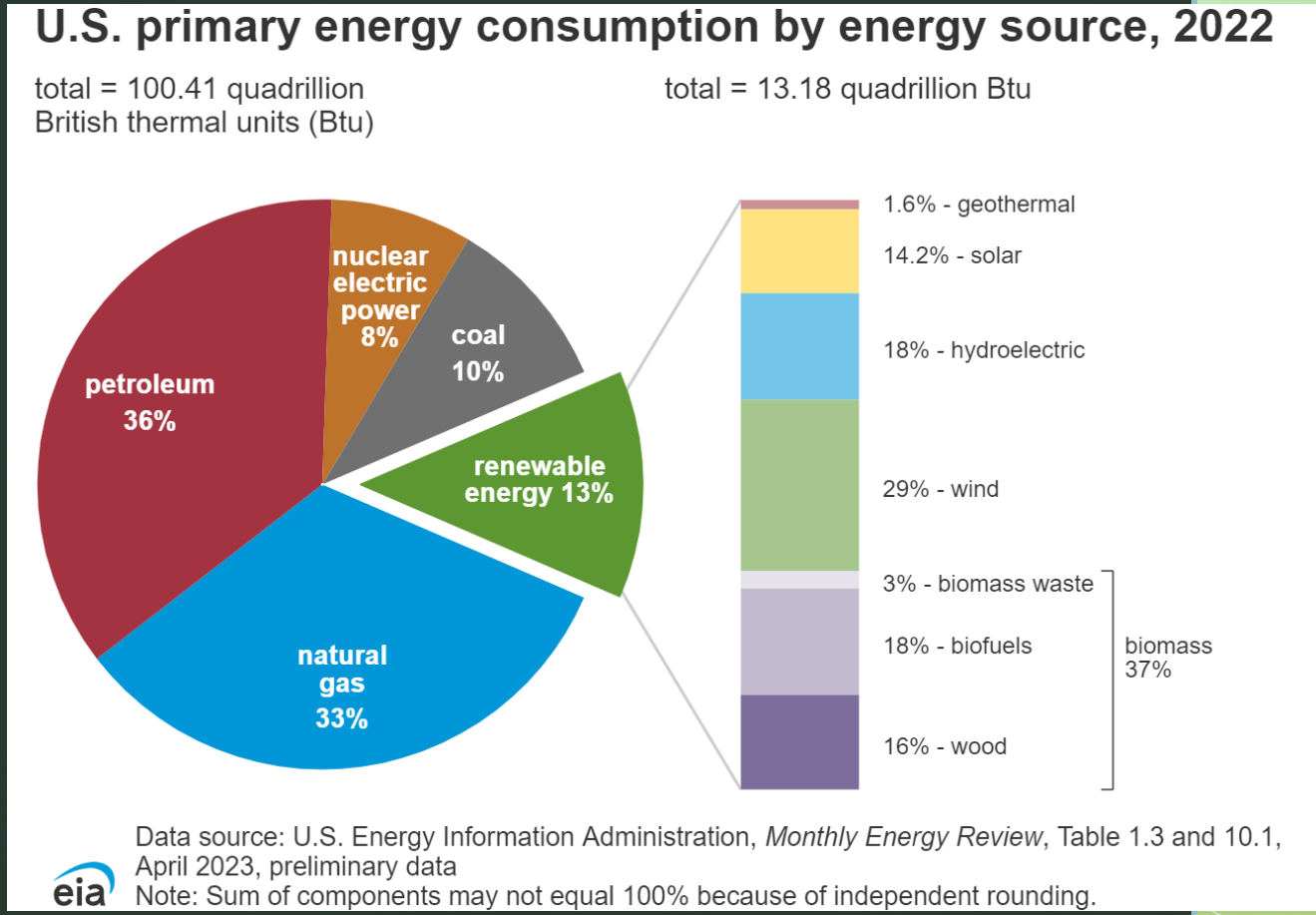


RAS Energy – diverse connected loads, many opportunities for optimization!

- Pumping is continuos and somewhat steady state.
- Heating should use natural gas or propane where available.
- AQ industry needs to become more stable and develop larger systems to employ industrial heat pumps.
- AQ industry is embracing LED lighting and additional lightig controls.

ELECTRICITY PRODUCTION IN THE US

- America isn't making electricity the way it did two decades ago
- Coal's decline has accelarated in recent years – lowering carbon dioxide emissions and other pollutions.
- Today, natural gas is dominant but renewable sources (e.g. wind, solar) are quickly growing.



FLORIDA’S ECONOMY/ELECTRICITY SITUATION

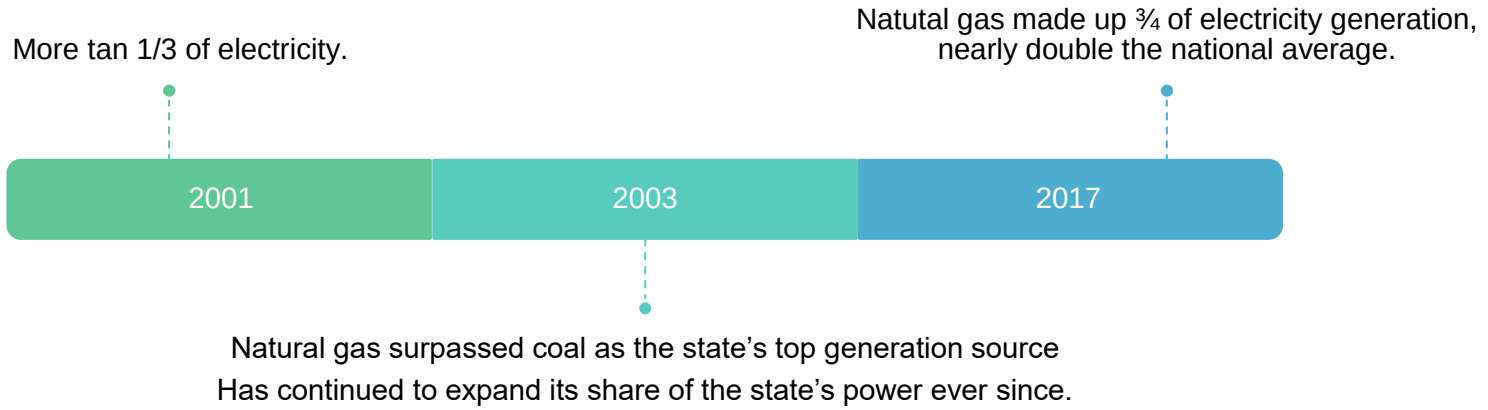
- Florida's economy ranks among the largest in the country; the fourth-largest in the US.
- Responsible for 5.23% (one-twentieth) of the United States' approximately $21 trillion gross domestic product (GDP).

CRONOLOGY

Nation's second-largest producer of electricity after Texas.

Still relies of neighbour states to meet the demand

Growth in its electricity sector has been among the fastest in the United States since 2007. Between 2008 and 2018, overall net generation in Florida increased by about 15%.

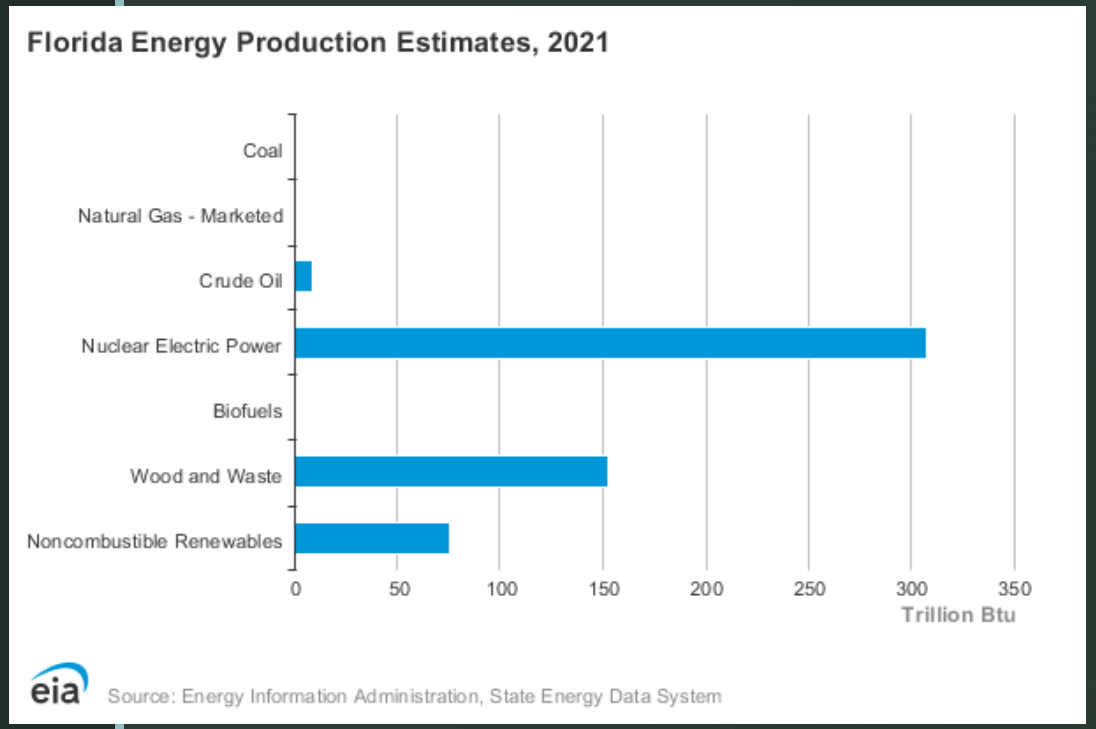


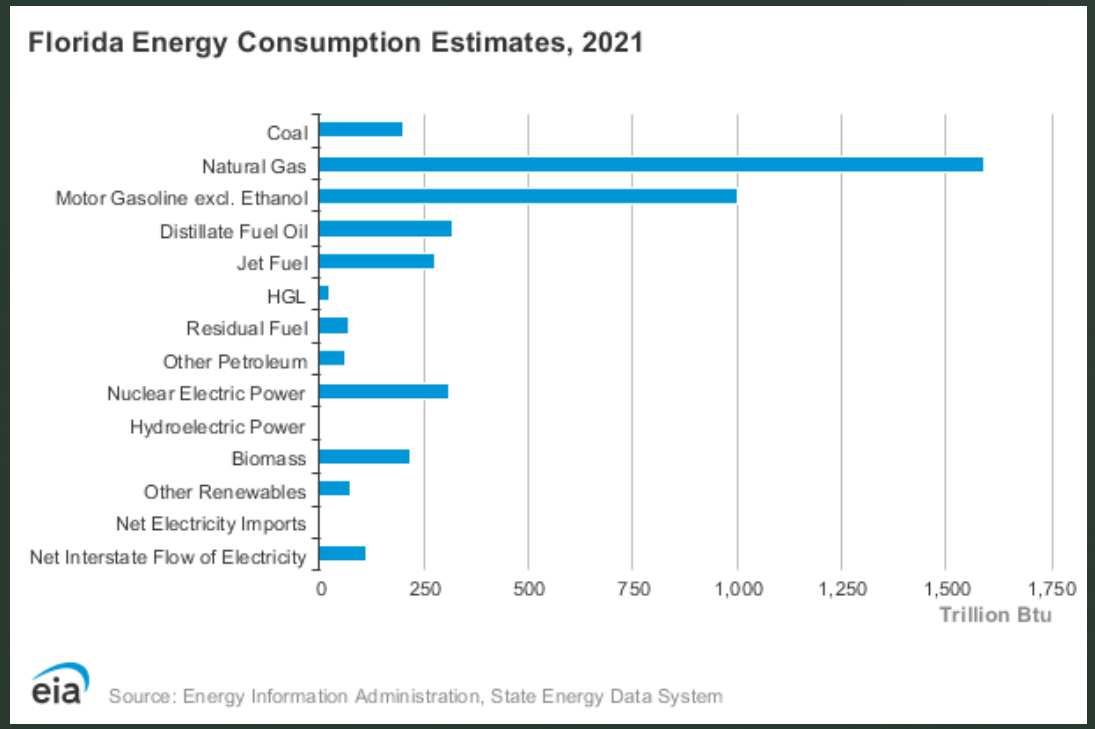
In 2022, natural gas fueled about 74% of Florida's total electricity net generation, nuclear power supplied about 12%, and renewable resources and coal provided almost all the rest.

Ranks №25 in states that uses the most electricity vs. lose the most power

Reasons: natural disasters (e.g. hurricanes, tropical storms)

FLORIDA ENERGY CONSUMPTION AND PRODUCTION





FL's ENERGY MODEL AND NEAR TERM OBJECTIVES

- NextEra Energy → world largest resources. World's largest generator of renewable energy from wind and sun and global leader in battery storage
- Florida Power & Light Company (FPL) → largest electric utility in the US

CONCLUSIONS- NATURAL GAS

Natural gas is the best fossil fuel gas in America:

- Clean and non-toxic
- Easily transferred through pipelines
- Less polluting fossil fuel
- Less expensive fossil fuel

CONCLUSIONS – LETS TALK SHRIMP

- The U.S. market for shrimp is almost insatiable
- It is the most commonly captured, harvested and processed for food production
- If you farm-raise the animals closer to the big markets, you'll eliminate the carbon footprint from global shipping and can deliver a fresh product to these local markets.
- Energy should and will be a key production cost

FINAL CONCLUSIONS

The transition to affordable renewable energy isn't an option – it's eventually the solution

AQ design can employ energy recovery systems – but costs can be prohibitive for small systems

AQ industry needs to become more stable and develop large systems to employ energy recovery processes.

FLORIDA is s great if not the best state to locate/start an energy intensive aquaculture and seafood processing facility

THANK YOU FOR MAKING THIS HAPPEN

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AQUACULTURE

Florida Marine Aquaculture Coalition

FMAC