

Coal Ash Harvesting for Beneficial Use

NC Concrete Pavement Conference
Airport Technology

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Founded in 1976,
500+ employees



Market fly ash in 13
states to over
800 concrete plants



Recycled 30M tons
of CCR



Developed and
own the STAR[®] process



Operate & maintain 4
STAR[®] beneficiation
facilities



Operate 7 additional
fly ash sources



SEFA is a Heidelberg Materials Company.



Over 30 million tons of fly ash recycled

- ✓ 11 million tons beneficiated through eight Thermal Beneficiation Facilities
- ✓ 6.5 million tons beneficiated through six STAR facilities
- ✓ 4 STAR beneficiation facilities recycle nearly 2 million tons of harvested ash per year
- ✓ 4.7 million tons of harvested ash processed to date



Beneficial Use of Coal Ash

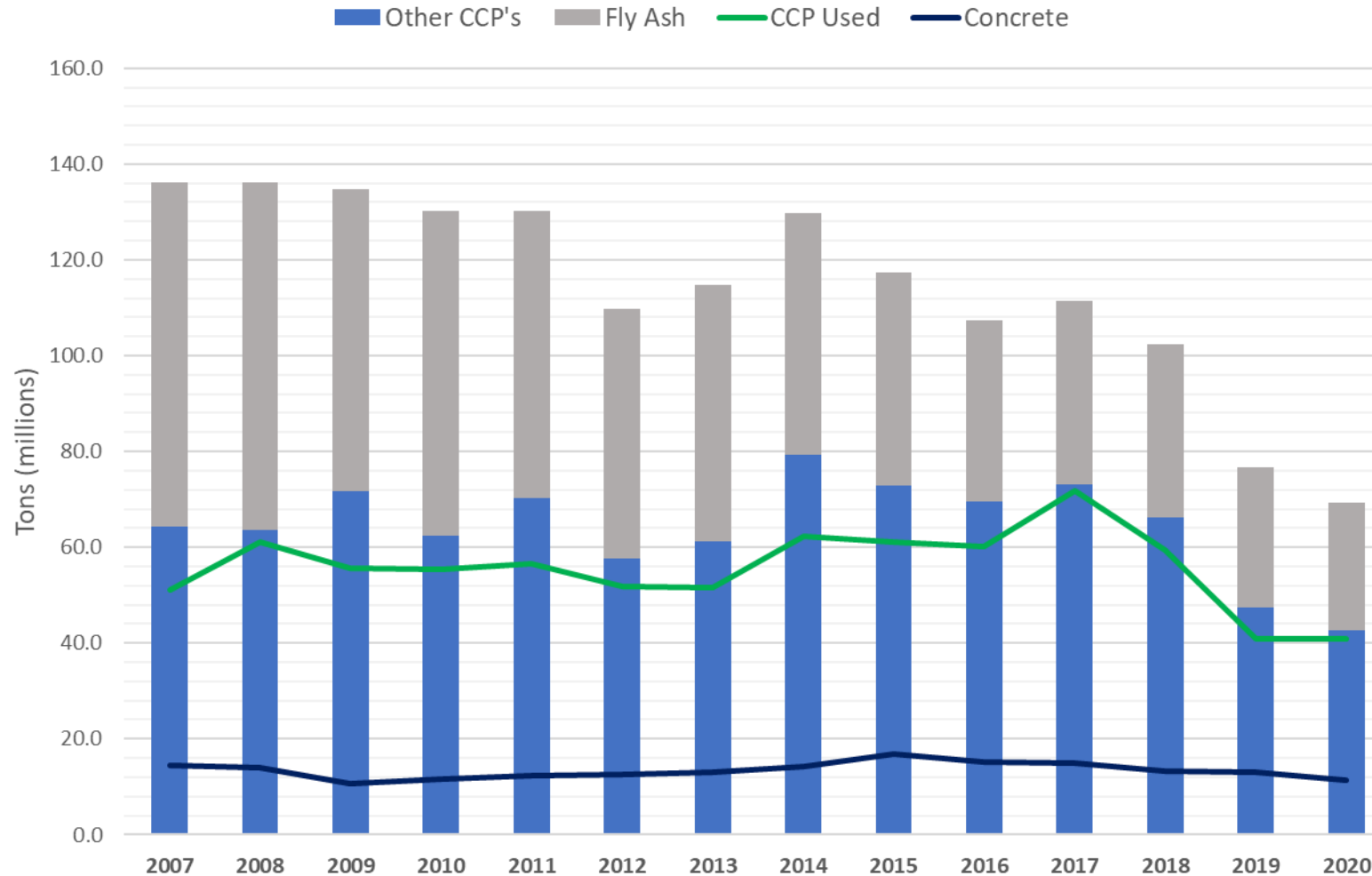
Maximizing Volumes Recycled



Beneficial Use of Coal Ash

Production & Use

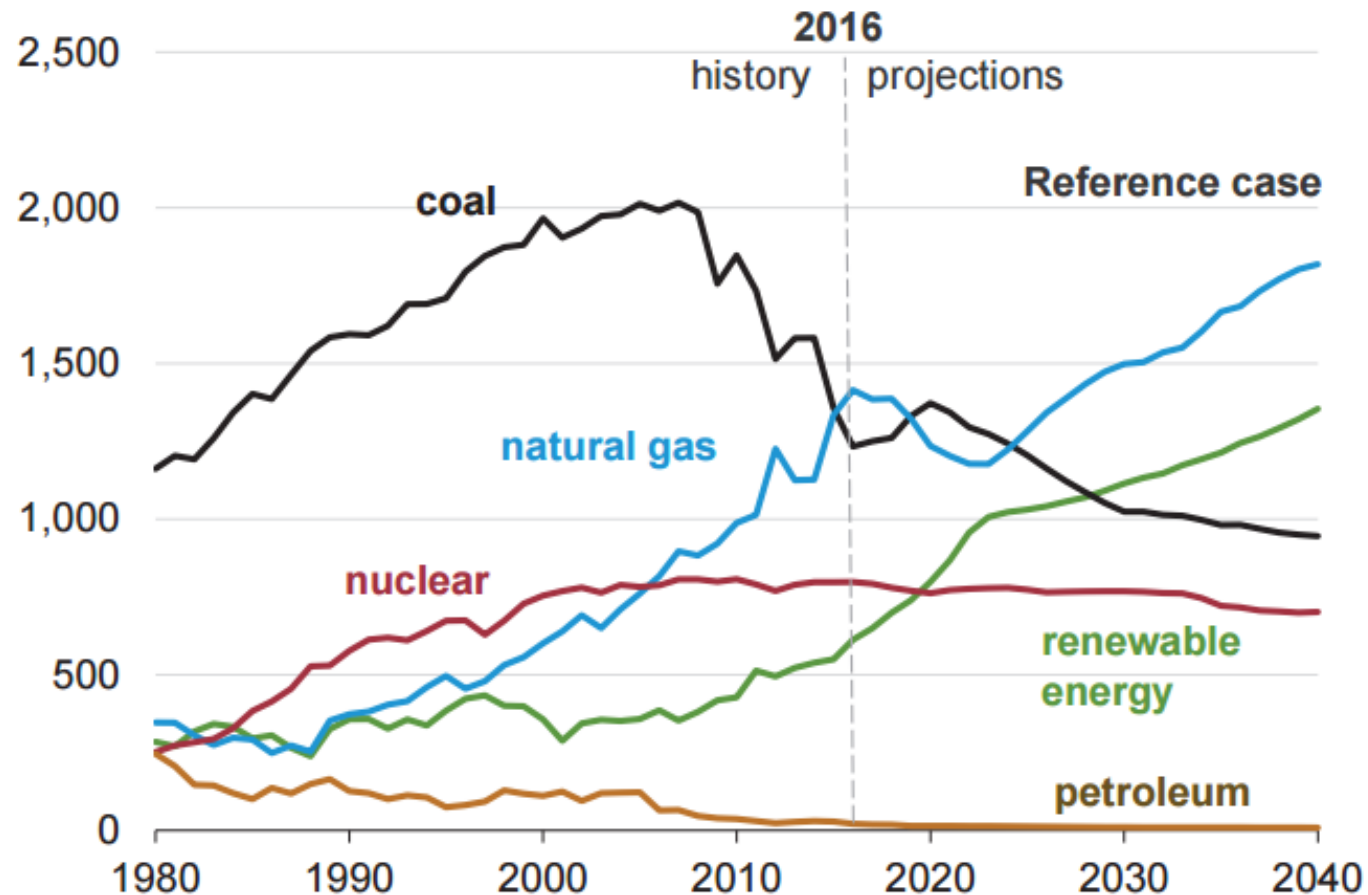
2020 CCP Production & Use



Coal Ash Harvesting

Future Coal Ash Availability

U.S. net electricity generation from select fuels
billion kilowatthours



A large pile of coal ash is being processed at a facility. In the foreground, a yellow wheel loader is positioned near the pile. The background shows industrial structures, including a tall tower and various pipes, under a clear blue sky. The scene is set outdoors on a paved area.

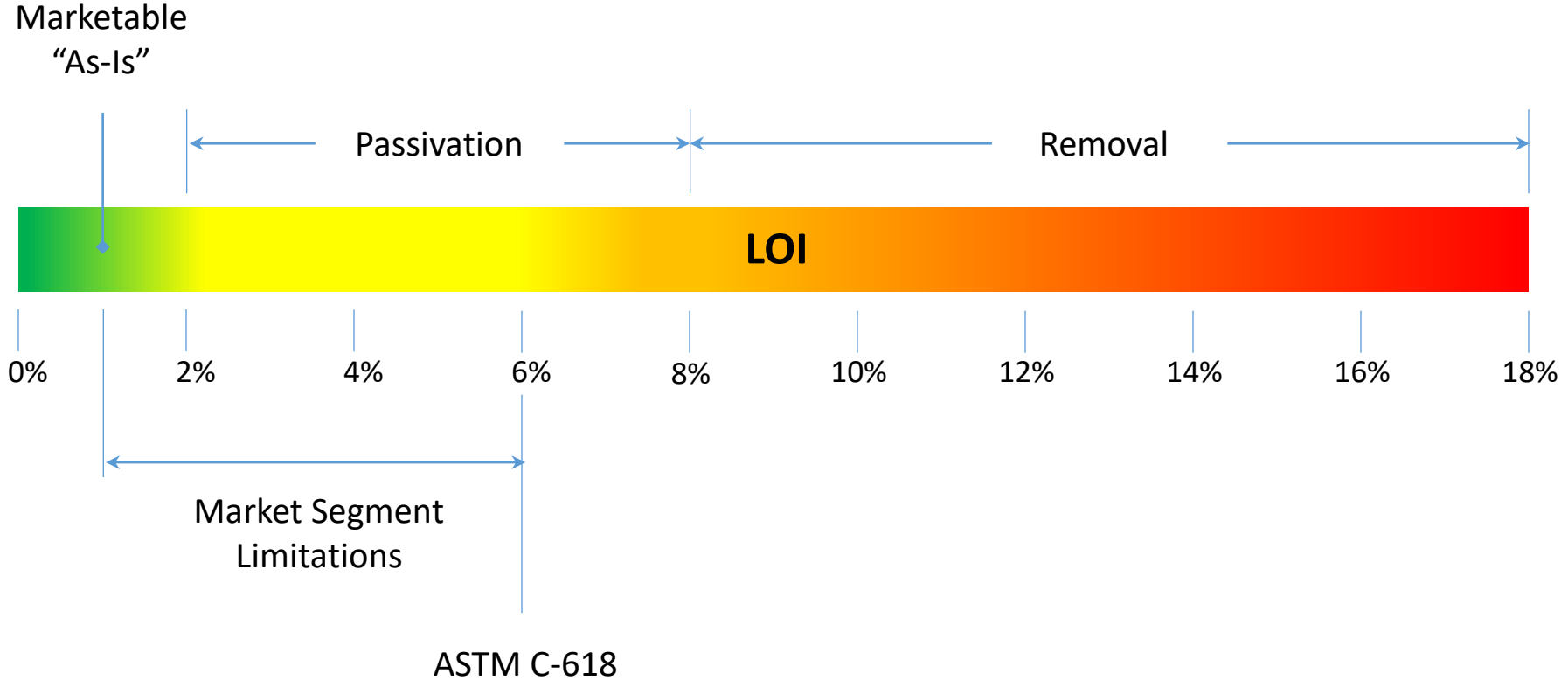
Coal Ash Beneficiation

Maximizing Volumes Recycled

Coal Ash Beneficiation

Beneficiation Technologies

The Carbon Conundrum





CONSISTENCY! CONSISTENCY! CONSISTENCY!

Superior Product Quality

Manufactured Product

Reclaimed Material Feed allows for consistent supply



consistent 

adjective | con·sis·tent | \kən-ˈsi-stənt\

a : marked by harmony, regularity, or steady continuity : free from variation or contradiction • a *consistent* style in painting

Recycling Coal Ash

Removing coal ash from ponds and converting the material for recycled use is an economical and sustainable solution with a variety of benefits.

ENVIRONMENTAL BENEFITS



Removes Coal Ash from the Environment

Reduces Use of Limited Natural Resources

Lowers Greenhouse Gas Emissions from Producing Cement

STRUCTURAL BENEFITS



Improves Durability for Longer-Lasting Infrastructure

Reduces the Effect of Water on Concrete

Improves the Strength of Concrete Roads, Bridges, and Buildings

ECONOMIC BENEFITS



Lowers Material Costs as a Reuse of Waste Materials

Lowers Cost of Impoundment Closures

Taxpayer Savings with Longer Lasting Roads and Bridges

Thermal Beneficiation



STAR[®] Thermal Beneficiation

Permanently Removing Coal Ash From the Environment

STAR Technology transforms coal ash from surface impoundments or ponds into a consistent, high-quality product for the concrete industry. Our process provides a permanent solution to remove coal ash from the environment.

Best Practice

Economical CCP management strategy

Proven Technology

4M tons of harvested coal ash has been recycled

Permanent Solution

Refining coal ash from ponds and landfills

Sustainable

Environmentally friendly, high-quality products

EPA Qualified

Beneficial & encapsulated use meets all environmental agency requirements

Advanced Design

14 years of technology refinement and operational development



- 8 thermal beneficiation facilities
- 6 STAR facilities
- 4 ash harvesting facilities



1999 – Wateree CBO



2002 – Winyah CBO



**2007 – McMeekin
STAR Plant**



**2012 – Morgantown
STAR Plant**



**2015 – Winyah
STAR Plant**

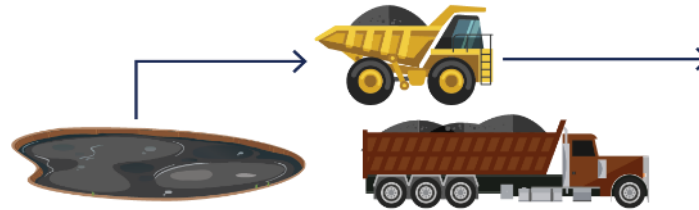


**2020 – Began operating
Duke Energy's NC
STAR recycling facilities**

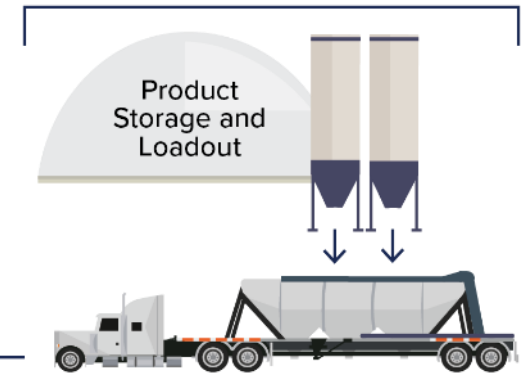
Recycling Harvested Coal Ash

Closure by Removal with Beneficiation:

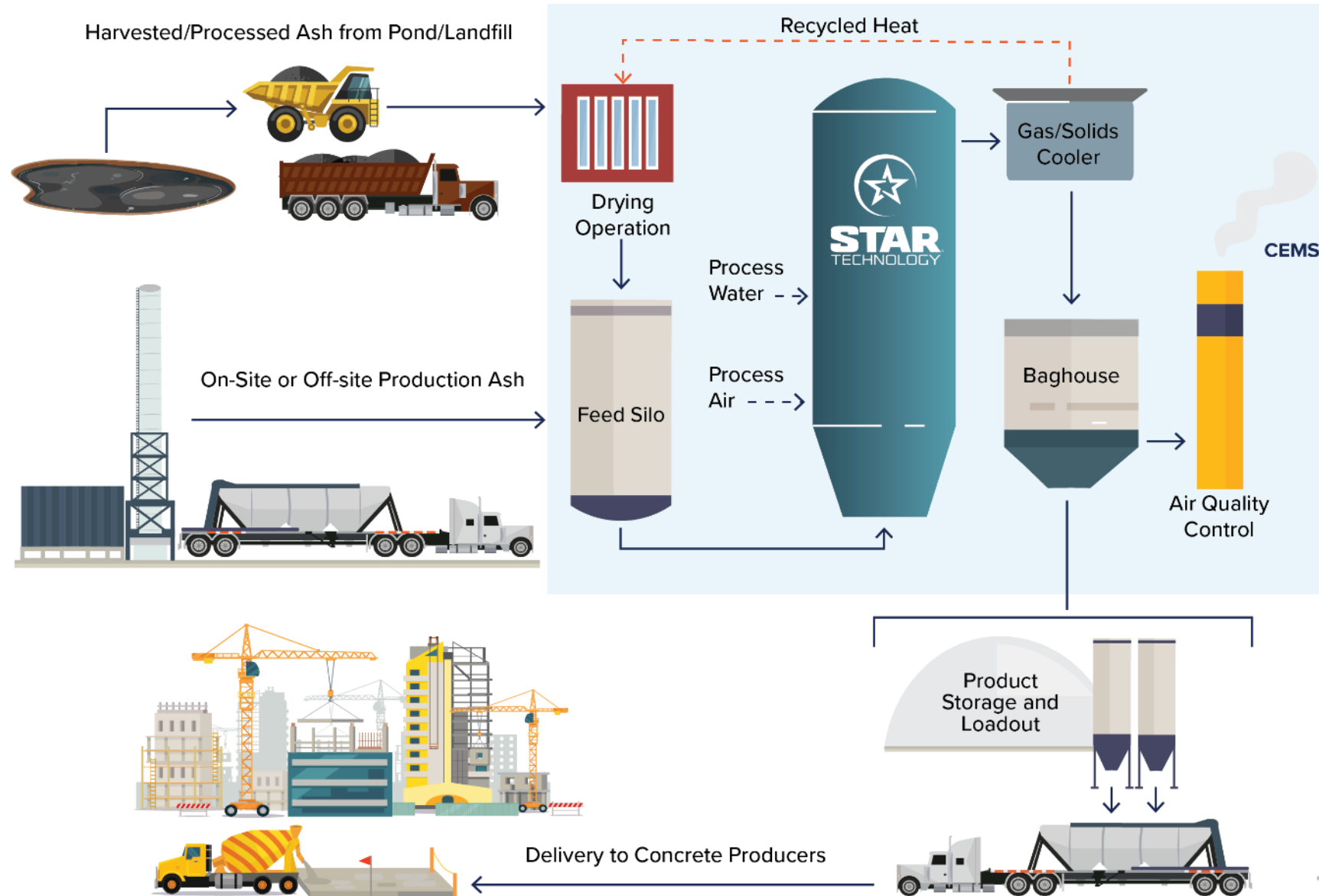
- ✓ Cost Effective
- ✓ Stand Alone Solution
- ✓ Eliminates Long-Term Liability



Delivery to Concrete Producers

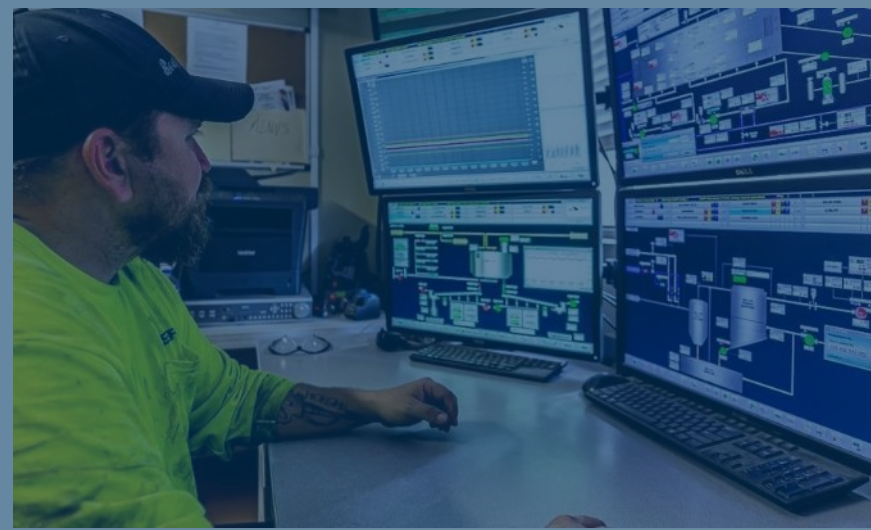


STAR[®] Process





Harvesting CCR Experience



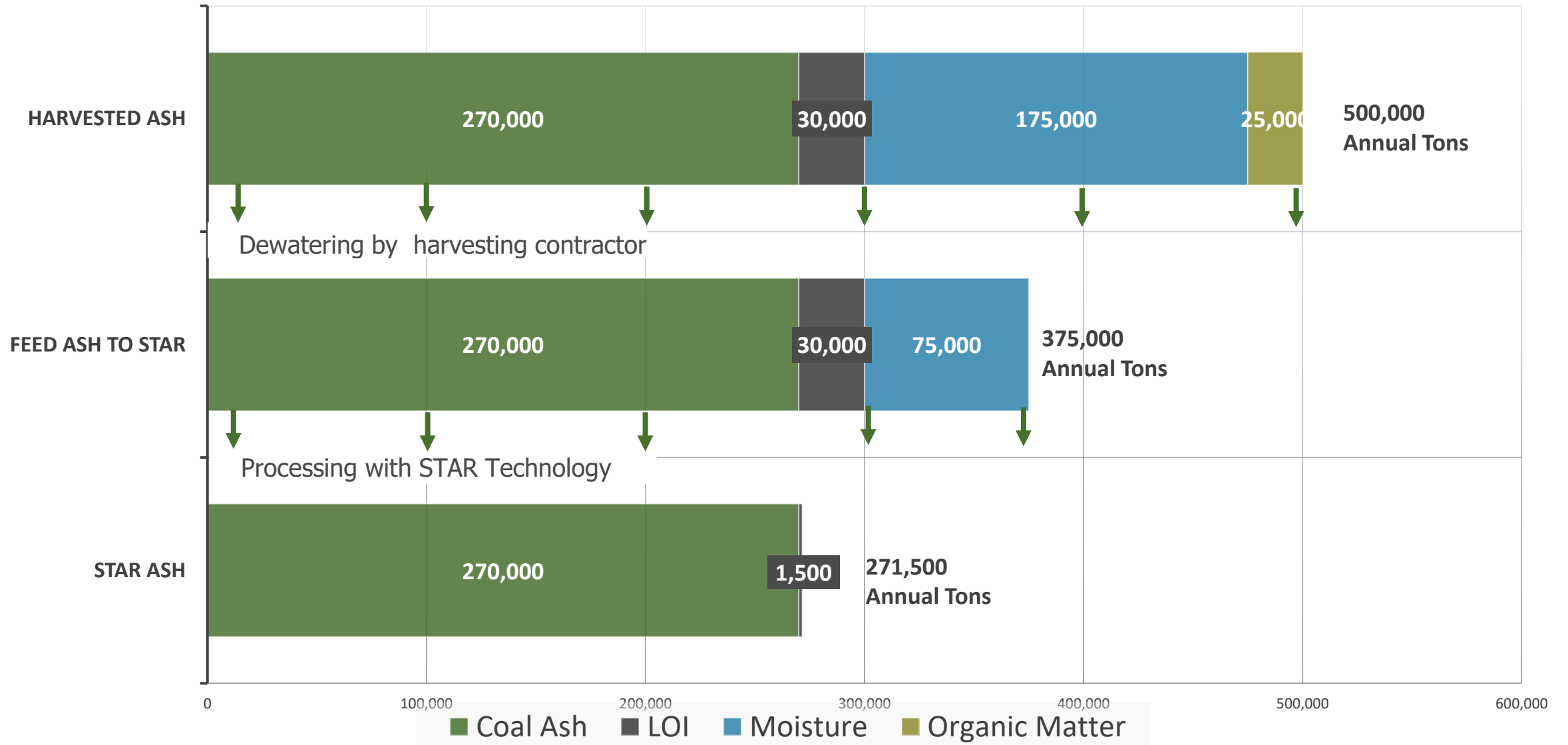
 **SEFA**

Harvesting & Reclaiming CCR



Coal Ash Harvesting

Harvested Ash to Beneficiated ASTM C618 Fly Ash





**Duke Energy STAR[®] Facility
450,000 Tons of Basin Ash Annually**

Ash Reclaim Storage



External Heat Exchangers



Grinding Circuit





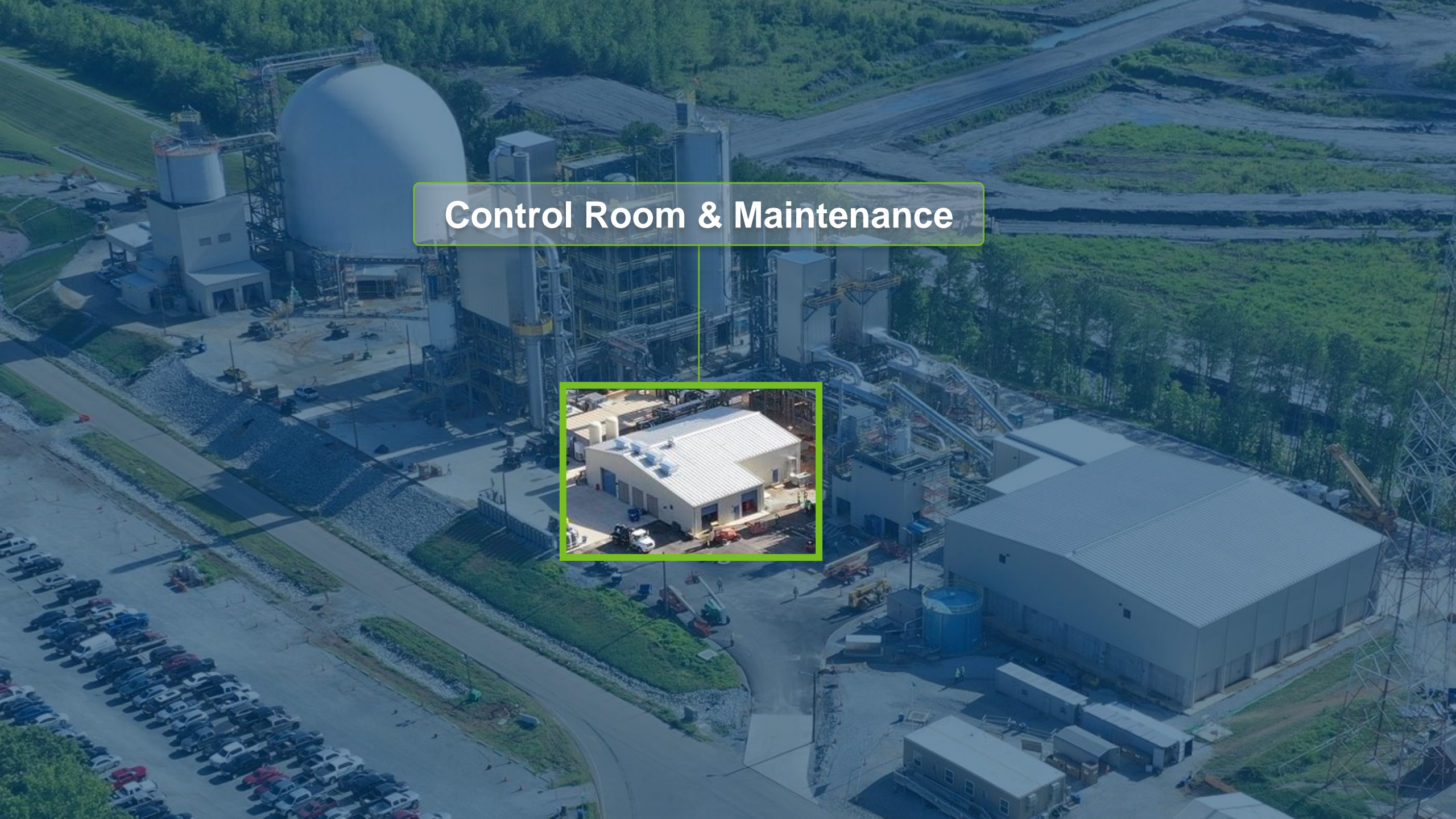
STAR[®] Process Island



Product Load Out & Storage



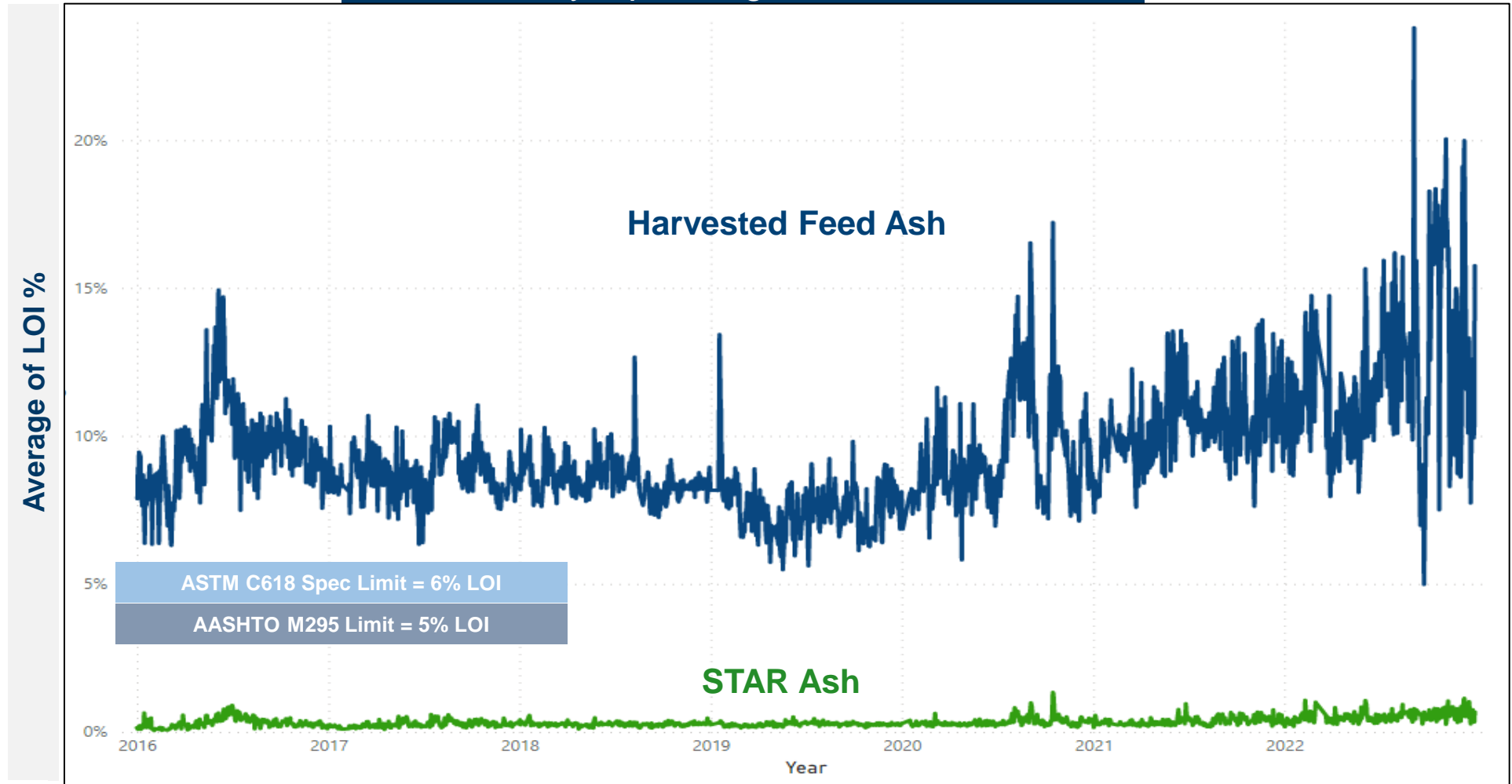
Control Room & Maintenance



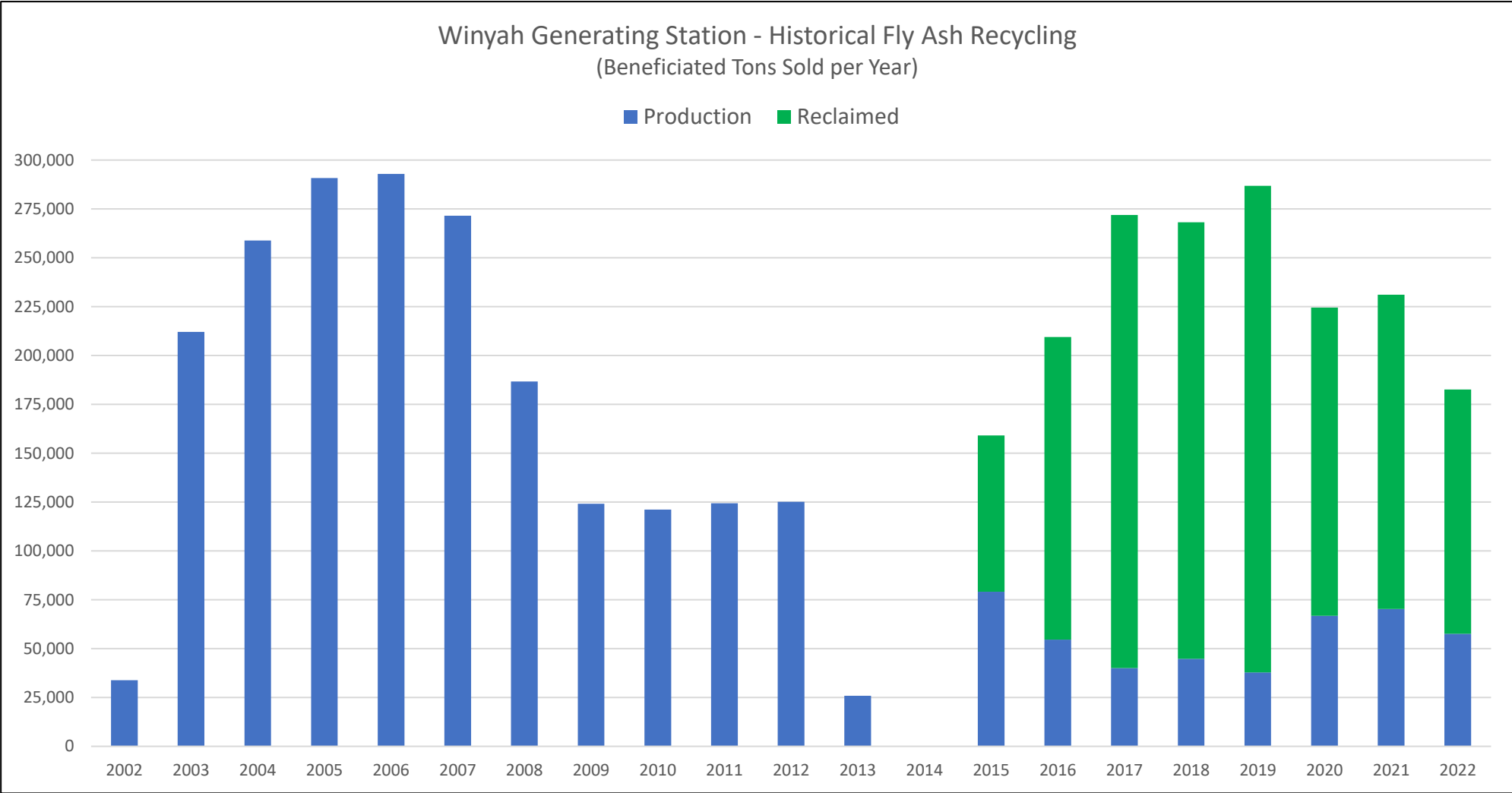


STAR Facility Daily LOIs

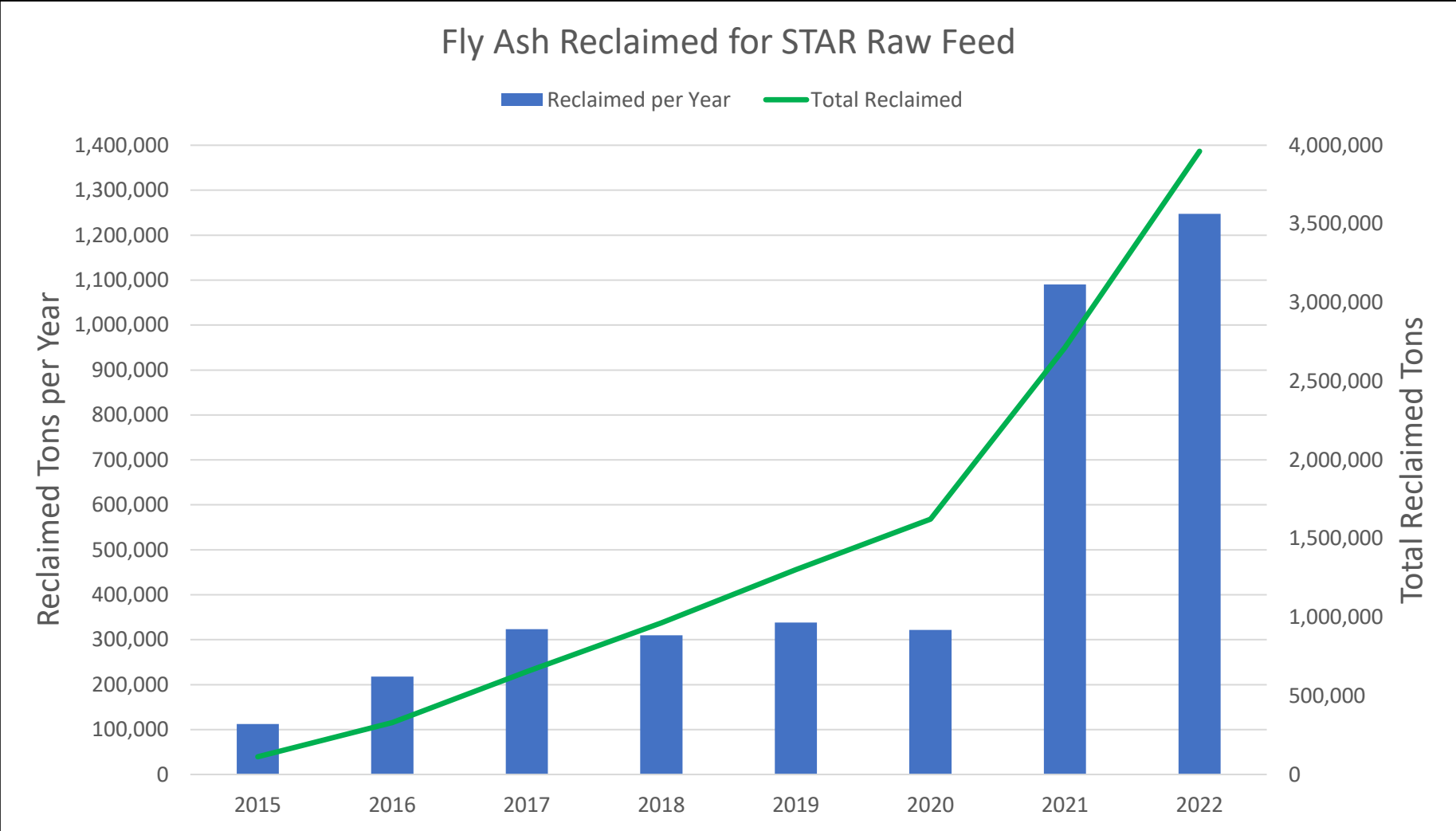
Actual Facility Operating 7 Consecutive Years



Coal Ash Harvesting



Coal Ash Harvesting



Airport Projects Containing Harvested Ash

- ❖ Charlotte Douglas Airport
- ❖ Raleigh-Durham Airport







THANK YOU! QUESTIONS?

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www.sefagroup.com

