Committee on Electricity

NARUC Summer Policy Summit

Committee on Electricity

Data Centers: Beneficial Load or Energy Hogs?

NARUC Summer Policy Summit

Data Centers: Beneficial Load or Energy Hogs?

Moderator: Hon. John Rosales, Ill.

Speakers:

Eduardo Balbis, Accenture

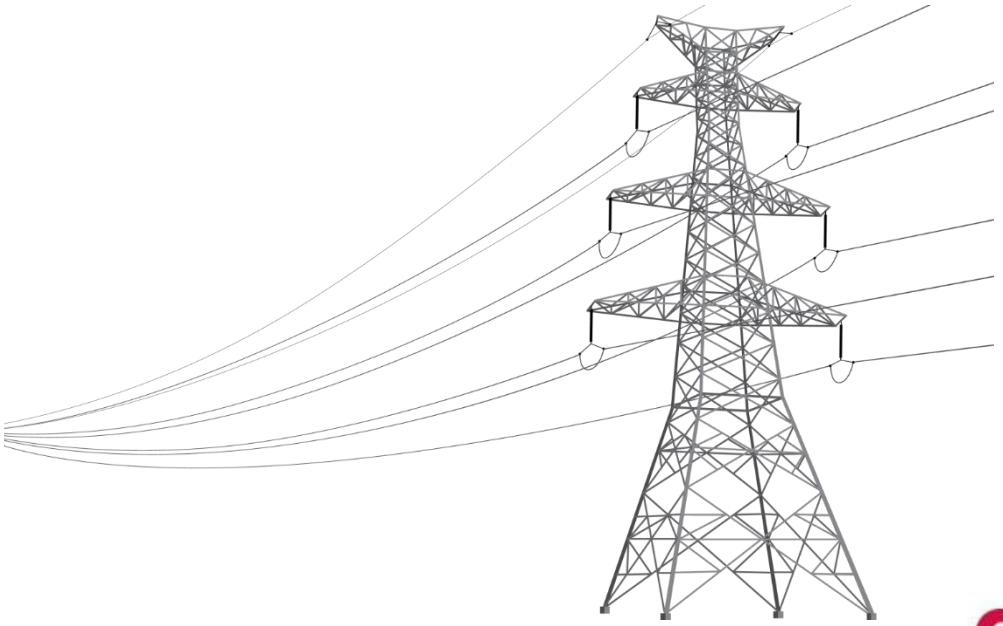
Sheila Owens, ComEd

Anne Kaiser, Georgia Power

ComEd
An Exelon Company

Data Centers: Beneficial Load or Energy Hogs?

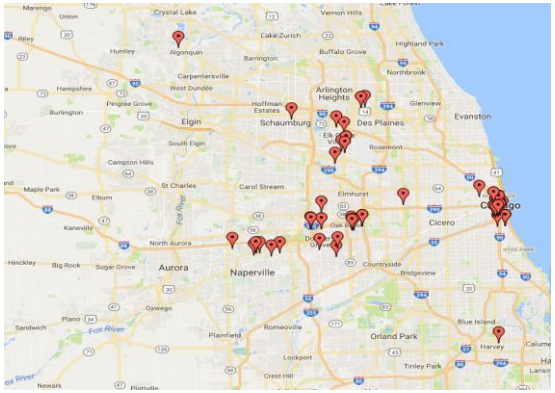
July 18, 2017

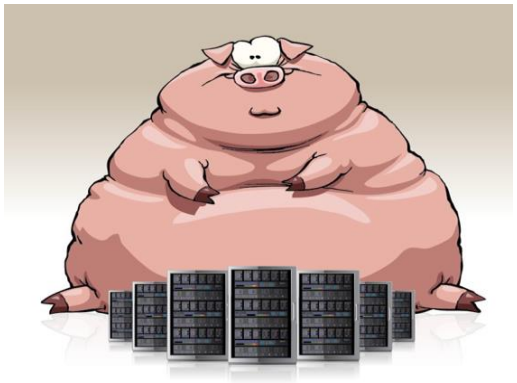


National Association of Regulatory Utility Commissioners

ComEd
An Exelon Company

Northern Illinois Market





- ✓ ComEd Data Center Customers
  - 70+ data centers in service with aggregate demand of over ~200MW
  - ComEd's 15 largest data center customers have a YOY growth rate of 20%
- ✓ Multiple Data Center Submarkets
  - Downtown Chicago
  - O'Hare & Western Suburbs
- ✓ Data Center Hub
  - Convergence of fiber networks – 'Best in Class' Electric Reliability – Minimal Risk from Natural Disasters – Competitive and low carbon electricity

Heroes in Energy Efficiency

- ✓ Leaders in ComEd's Energy Efficiency Program
  - 80 projects achieving over 90,000,000kWh in savings (2008-Present)
  - Combined have earned $6.3M in incentive dollars (2008-Present)

- ✓ Energy Efficiency Trends
  - Automation of all data center processes
  - Increased efficiency of air-cooled chillers
  - Server technology improvements

Continued Growth and Trends

- ✓ Data Center Attraction
  - Rapid Response Team
  - Data Center Express/Intersect Illinois/EDOs
  - Line Extension Policy
- ✓ Win Some; Lose Some
  - Water consumption
  - Space
  - Jobs; Jobs; Jobs
  - Incentives
- ✓ Trends
  - Focus on “campus” style sites
  - Higher power density
  - Reserve Capacity tariffs/minimum bill

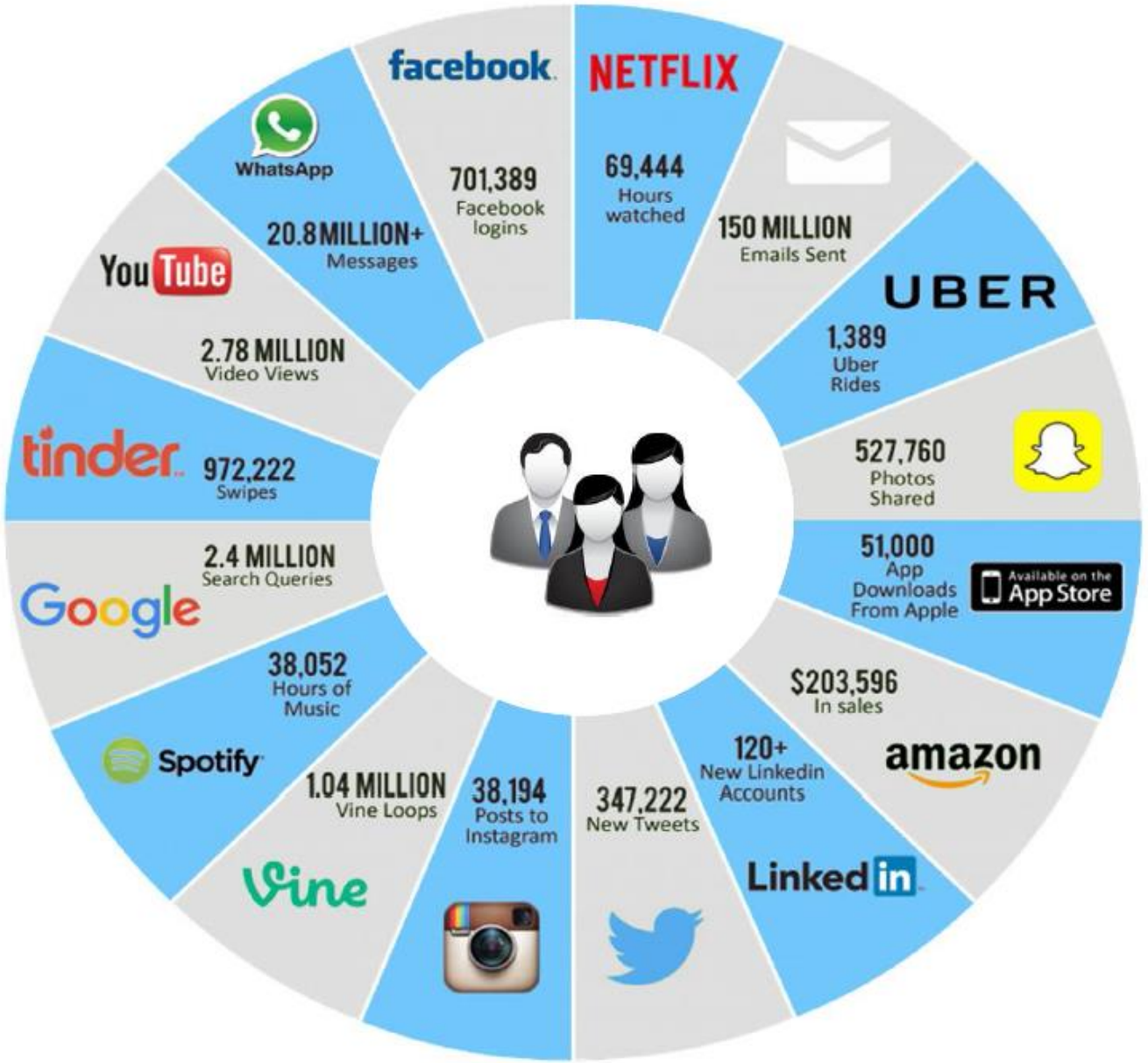
Wrap up and Questions

- **Sheila Owens**
  Vice President, Economic & Business Development
  ComEd
  Three Lincoln Centre
  Oakbrook Terrace, IL 60181
  sheila.owens@comed.com

From Marketing and Collaboration to Capacity Build Out


SE DATA CENTERS
2:57
Georgia Power

DATA CENTERS What Happens in an Internet Minute?

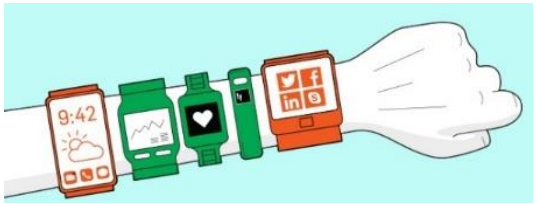


DATA CENTERS – THEN AND NOW

FROM $1 M to > $100B

WHERE WE WERE

WHERE WE ARE HEADED TO THE INTERNET OF EVERYTHING



DATA CENTERS

THE ROLE OF UTILITIES AND CITIES OF THE FUTURE

FLEXIBILITY: Rotating between asphalt, grass and PV cells, spaces can dynamically shift from city street park to change energy source

RENEWABLE AND COST-FRIENDLY STATE


Blue Canyon Wind Farm, OK


Georgia Power Corp HQ Roof Solar Demo


Fort Stewart 30 MW Military

- Georgia Power offers electricity rates averaging 13 % the national average
- Competitive pricing
- Georgia Power plans to build or procure 1.6 GW of renewable energy by 2021
  - Georgia Power reached 855 MW of Solar resources in 2017 – an increase from 15MW from 2010
  - Largest voluntary renewable portfolio in the country
  - 25 % clean energy including nuclear
- Energy Efficiency Rebate Programs


IMAGINE
ROOM TO BREATHE
More tree coverage in Atlanta
than any other major U.S. city
CHOOSEATL
ChooseATL.com #ChooseATL

Lunch Break!
Back by 1:30

NARUC Summer Policy Summit

Electricity Committee & Subcommittee on Clean Coal and Carbon Management

NARUC Summer Policy Summit

Hon. Jeremy Oden, Alabama Chair, Subcommittee on Clean Coal & Carbon Management

Report on Meeting with National Energy Technology Laboratory

Clean Coal Site Visit to Morgantown, WV

Clean Coal Site Visit to Morgantown, WV

Clean Coal Site Visit to Morgantown, WV

Clean Coal Site Visit to Morgantown, WV

Clean Coal Site Visit to Morgantown, WV

Clean Coal Site Visit to Morgantown, WV

Petra Nova Site Visit

September 22, 2017: site visit to Petra Nova project in Houston, TX

- First successful carbon capture for enhanced oil recovery (CO2-EOR) facility
- Began operating December 2016
- Captures over 5,000 tons of CO2 per day from 240 MW coal unit

Travel assistance available on first-come, first-serve basis for commissioners!

Coal Ash Issues

Moderator: Hon. Jeremy Oden, Alabama

Speakers:

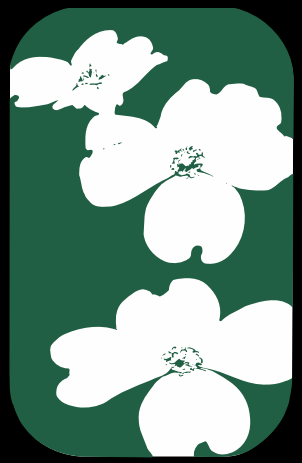
Frank Holleman, SELC

Jimmy Knowles, The SEFA Group

Ann Loomis, Dominion Resources

Cindy Menhorn, MCR Performance Solutions

FRANK HOLLEMAN
Senior Attorney
fholleman@selcnc.org



Southern Environmental Law Center

SouthernEnvironment.org

COAL ASH ISSUES - CLOSURE OPTIONS

Jimmy Knowles | VP of Research and Development

Tuesday, July 18th


$$$$
COST
$
Closure by Removal requires that the coal ash be excavated, moved, and then reburied in a lined landfill.
Closure by Removal
Closure by Removal reduces environmental risk, but costs 3 to 6 times as much as Cap In Place
Environmental Benefits
✓ Eliminates the Coal Ash
✓ Lowers Global CO_2
✓ Longer-lasting Public Infrastructure
✓ Lower Cost of Concrete
NO LONG TERM ENVIRONMENTAL RISK
Beneficial Use In Concrete
Requires excavation, but rather than re-burying the ash, it is processed and used to make concrete.
Using the coal ash in concrete eliminates all the environmental risk from the ash. The ash is permanently removed from the environment as it is transformed into the "glue" that holds the concrete together.
The cost will be more than Cap In Place, but less than Closure by Removal
Cap in Place is the minimum requirement allowed by US EPA.
Cap In Place
Cap in Place is the lowest cost option
low
ENVIRONMENTAL BENEFIT
high

TYPE OF CLOSURE	SCOPE OF WORK	ENVIRONMENTAL BENEFIT	RELATIVE COST
"Cap In Place" (1 - 2 Years)	› Dewater pond › Install impervious liner system on top of ash › Long-term, post-closure monitoring	Coal Ash is left where it is	$ Baseline Cost Varies according to size of pond
Closure by Removal (3 - 5+ years) depending on size of pond	› Dewater pond › Install impervious liner system on top of ash › Long-term, post closure monitoring › Permit and construct new CCR Landfill › Excavate all pond ash › Transport all pond ash to CCR Landfill › Place and compact ash in CCR Landfill	Coal Ash is moved to a landfill	$$$$$$ 3 - 6X the cost of "Cap in Place"
Excavation with Beneficial Use in Concrete (10 - 20+ years) depending on size of pond, typically 300,000 - 500,000 tons per year	› Dewater pond › Excavate all pond ash › Transport all pond ash to beneficiation plant › Beneficiate and use ash in concrete production	Coal Ash is permanently removed from the environment	$$$ 1 1/2 - 3X the cost of "Cap in Place"

Information prepared by The SEFA Group, a marketer and producer of specification grade fly ash sold to the concrete industry

ANY QUESTIONS?

Contact Jimmy Knowles
jknowles@sefagroup.com

Dominion Energy's Commitment to Safe Coal Ash Management

Ann Loomis
Senior Director, Federal Affairs and Environmental Policy
July 18, 2017

Dominion Energy

Coal Ash Management

- Closing 11 coal ash ponds at 4 Virginia power stations
- 7 ponds closed by removal
- Water permits issued for 3 of 4 Virginia power stations
- Wet to dry ash management and construction of a new landfill at Chesterfield Power Station
- Assessment of closure plans ongoing per new Virginia statute

Dominion Energy

Coal Ash Pond Closure Study

Report due to Virginia General Assembly December 1, 2017

- Virginia statute enacted in 2017 requires a study of closure alternatives for ash ponds submitted to DEQ.
- Moratorium on DEQ issuing solid waste permits for closure of ash ponds until May 2018.
- Includes a study of recycling, excavation, surface water and groundwater conditions, corrective actions and safety for the ponds at the four stations.
- Study reviews prior evaluation of pond closures and will supplement as needed.

Dominion Energy

Closure Alternatives

- Closure alternatives include:
  - Closure in place
  - Closure by removal
    - ❑ Removal and beneficial reuse
    - ❑ Removal and consolidation
    - ❑ Removal and disposal on or off-site.

- Industry Assessment
  - 432 Ponds Polled
  - 62% Closure in Place
  - 38% Closure by Removal

Possum Point Pond A, B, C

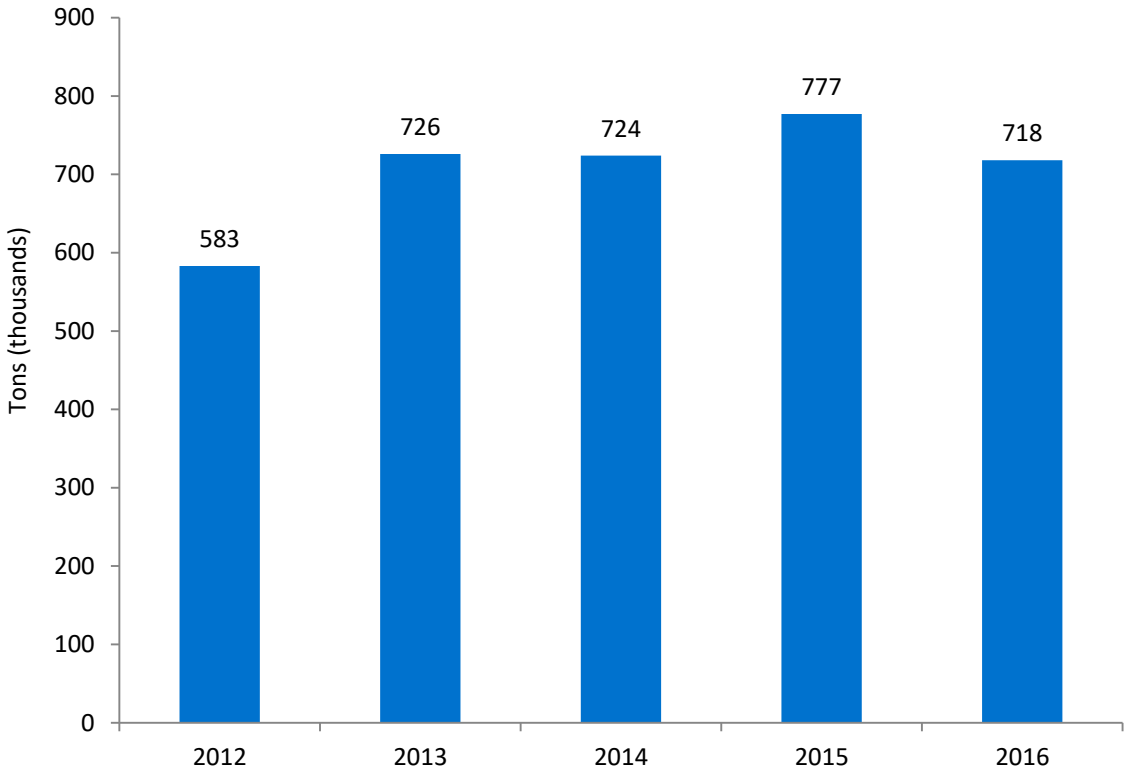
Possum Point Pond D

USWAG UTILITY SOLID WASTE ACTIVITIES GROUP

Dominion Energy

Dominion Energy's Coal Combustion Residual (CCR) Recycling

In 2016, Dominion Energy recycled just over 20% of the CCR material it produced.



Dominion Energy

Environmental Liability Risk Transfer Overview
Summer NARUC Meeting

Cindy Menhorn
VP, Regulatory Services
July 18, 2017

What is Environmental Liability Risk Transfer?

- Risk transfer allows the utility (Seller) to transfer title of the real estate and all environmental obligations to a third party (Purchaser)
- Costs to achieve a regulatory closure are negotiated between the Purchaser and Seller
- Purchaser provides a highly collateralized indemnity to Seller as protection

© 2017 All Rights Reserved

Risk Transfer Option – Key Points of Consideration for Utilities

- Clearly defined exit strategy
- Post closure re-development plan
- Accretive to shareholder value
- Comprehensive closure plan deemed reasonable and prudent
- Access to environmental insurance instruments

© 2017 All Rights Reserved

Differences: Closure Managed by Utility vs. Risk Transfer Company

	Utility	Risk Transfer Company
Title	Stays with utility	Takes title of property and assumes liabilities
Communication	Discussed same issues as before closure	Produces options for redevelopment, more jobs and tax base increase
Insurability	Has limited options	Provides more options for insurance products
Risk	Retains risk	Assumes risk, which is covered by insurance

© 2017 All Rights Reserved

Sample Risk Transfer Transaction – What's Covered and How?

		COLLATERAL						
						ADDITIONAL COLLATERAL IF PURCHASER IS IN DEFAULT		
	ENVIRONMENTAL RISK EXAMPLE	PURCHASER	ESCROW	BONDS	PLL	EXCESS INDEMNITY	LETTER OF CREDIT	PURCHASED ASSESTS (LAND)
1	Cost of remedial work for known conditions on or emanating from the site	✓	✓			✓	✓	✓
2	Cost over run for remedial work known conditions	✓	✓			✓	✓	✓
3	Cost of asbestos abatement, plant dismantlement	✓	✓	✓		✓	✓	✓
4	Cost overrun AD&D work	✓	✓	✓		✓	✓	✓
5	New contamination discovered on or emanating from the site	✓	✓		✓	✓	✓	✓
6	Regulations change - more expensive remedial action	✓	✓			✓	✓	✓
7	Regulatory reopener post closure	✓	✓		✓	✓	✓	✓
8	Offsite natural resources damages - occurred pre-closing, claim post closing				✓			
9	Offsite generator liability for pre-closing activities by seller				✓			
10	Adjoining property sues for personal injury because their well is contaminated (Toxic Tort)				✓			
11	Offsite property damage claims from pre-closing site conditions				✓			

© 2017 All Rights Reserved

Contact Information

Cindy Menhorn
cmenhorn@mcr-group.com
Tel: 724-244-5333

MCR PERFORMANCE SOLUTIONS
www.mcr-group.com
155 North Pfingsten Road
Suite 155
Deerfield, IL 60015
Tel: 847-562-0066

© 2017 All Rights Reserved

Committee on Electricity

NARUC Summer Policy Summit