

Energy Master Plan Summary Document

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Proposed Planning & Implementation Process

Energy Enterprise Zone Plan

Phase 1: Initial Engagement,
Research & Education



Phase 2: Feasibility of Preferred
Options



Phase 3: Local Consensus on Preferred
Options



Phase 4: Development of Strategies
to Support Preferred Options



Phase 5: Multi-Jurisdictional
Implementation

Phase 1: Initial Engagement, Research & Education

- 
- Public Information Session
 - Website Created for Information
 - Local Workshops Hosted for Residents
 - Expert Interviews
 - Comprehensive Review of Local
Master Plans & Zoning
 - Comprehensive Review of State
Planning / CAFRA Mapping / Regional
Infrastructure

Oyster Creek

- 625MW nuclear plant
- 707 permanent jobs
- \$2.2MM in property tax paid to Lacey Township
- Draws water from Barnegat Bay
- Currently supplies approximately 6% of NJ electricity
- Plan for shutdown
 - 12/31/19 shutdown
 - 12/31/21 “Layup” completion
 - 12/31/31 Earliest “tear down” completion
 - 12/31/81 Latest “tear down” completion
- \$750MM projection for cost of decommissioning

NJ Energy Master Plan

Updated by Christie Administration December of 2011

- As required by law, EMP includes long-term objectives and measures necessary to achieve those objectives. Five overarching goals:
 1. *Drive down the cost of energy for all customers*
 2. *Promote a diverse portfolio of new, clean, in-state generation*
 3. *Reward energy efficiency and energy conservation and reduce peak demand*
 4. *Capitalize on emerging technologies for transportation power production*
 5. *Maintain support for the renewable energy portfolio standard of 22.5% of energy from renewable resources by 2021*

NJ Energy Master Plan

Challenges from Retirement of Oyster Creek

- “Replacement of Oyster Creek generation has potential to add generation that increases NJ’s carbon footprint” (nothing is cleaner than nukes in terms of air emissions)
- “In addition, PJM reports that Oyster Creek’s geographic location has prevented significant transmission bottlenecks and overloads in the state”
- “Unless replaced by new comparable base load generation, at least \$100 million in transmission upgrades will be required when Oyster Creek retired (excluding possible need to acquire new ROW’s)”

Concerns of an Energy Generating Community

- Environmental Concerns
 - Air emissions
 - Water usage / discharge
 - Land usage / development
- Safety Concerns
 - Fuel storage and spent fuel / ash disposition
- Quality of Life Issues
 - Industrial truck traffic
 - Congestion of water ways

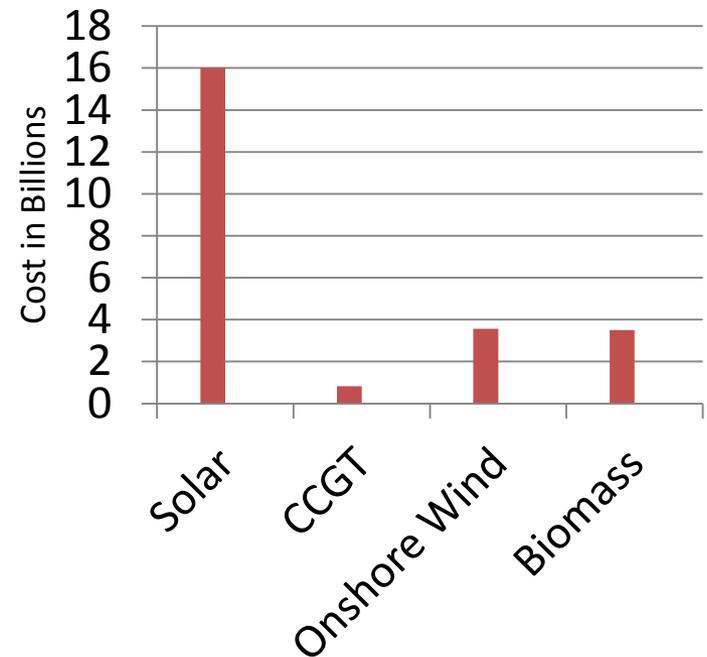
Benefits to an Energy Generating Community

- Employment during construction
- Permanent employment post-construction
- Spending by workers in local community
- Purchases by plant from local vendors
- Property / Use Tax or Payment in Lieu of Taxes
- Community participation / donations
 - Charities
 - Public safety equipment and facilities
 - Electric costs to local residents / businesses because occasion for imports and congestion to serve local loads are diminished with local generation

Replacing the energy source: COST

Replacing the 615 MW from Oyster Creek Equivalent Cost

- **Solar** cost approx. \$16 billion (Costs have been dropping and may continue.)
You would need almost 4,000 MW of solar to produce the equivalent amount of energy as Oyster Creek.
A recent project in CA. with 534 MW required 6000 acres of land.
- **Combined Cycle Gas Turbine** cost \$834 million. (Exclusive of construction of necessary gas lines.)
- **Onshore Wind**, if practical, cost \$3.56 billion
- **Biomass Gasification** (not burning) cost \$3.5 billion



Considerations

How do Available Technologies Rate?

- **Solar** would require large clear cut area for any substantial project unlikely in Pinelands or CAFRA. Short term construction jobs but negligible operating and maintenance jobs. Solar improvements currently are not taxable.
- **Combined Cycle Gas Turbine** and **Biomass** Plants have relatively small footprints. Generation could be a private sector or public-private sector property which would become subject to a property tax program or PILOT program. Large construction work force 24-36 months and requires ongoing operations and maintenance staff.
- Recent approved LS Power in Gloucester County (CHP) will employ a workforce of approx. 650 construction workers and 20 -30 permanent workers. Construction jobs are expected to infuse the local economy by \$100 million, and approx \$1.7 million in PILOT (tax program).
- **Onshore wind** very difficult in coastal flyway and numerous environmental restrictions for a large scale project.
- No **Offshore wind** projects have been built in the US so costs are difficult to estimate

What is Most Likely to Replace Oyster Creek?

- A 650 to 850 MW Natural Gas Fired, Combined Cycle Generating Plant
- Cost to develop = \$650MM to \$900MM
- Permanent jobs = 25 – 30
- Construction jobs over 3 year construction cycle = 450 – 550
- Local Tax or PILOT = \$2 - \$3 million
- Other Possible Benefits or Contributions to Community
 - Assistance with job training from Exelon, new developer or state
 - Seed money to attract other industry to offset job loss
 - Construction jobs – Apprenticeships targeted to local residents

Nuclear & Natural Gas Comparison

	Oyster Creek	New Plant
Size in MW	625	650 – 850
Fuel	Nuclear	Natural Gas
Cycle	Boiling Water Reactor	Combined Cycle (combustion and steam turbines)
Type	Base Load	Load Following
Revenue Sources	Capacity and Energy	Capacity, Energy and Ancillary Services
Load Factor	90 – 95%	80%
Permanent Jobs	700	25 - 30
Local Tax or PILOT	\$2.2 million	\$2.0 - \$3.0 million

Comparison of Proposed and Existing Power Plants Characteristics and Host Location Benefits

	W. Deptford	Newark Energy Center	CPV Woodbridge Energy Center	Old Bridge	CPV Valley Energy Center	Longview Power	Bayonne Energy Center	Salem Harbor
Location	W. Deptford, NJ	Newark (Ironbound) NJ	Woodbridge NJ	Old Bridge, NJ	Waywayanda, NY	Maidsville, WV	Bayonne, NJ	Salem, MA
Owner	LS Power	Hess	Competitive Power Ventures	NRG	Competitive Power Ventures		Hess	Dominion
Status	Approved	Approved	Proposed	Proposed	Construction	Construction	Proposed	Slated to Close by 12/31/14
Size	738 MW	655 MW	700 MW	600 MW	650 MW	695 MW	512 MW	583 MW
Primary Fuel	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Natural Gas	Coal (Mine Mouth)	Natural Gas	Coal/oil
Technology	Combined Cycle	Combined Cycle	Combined Cycle	Combined Cycle	Combined Cycle	Boiler and Steam Turbine	Combined Cycle	Boiler and Steam Turbine
Acres	302	25	25-40		122			65
Cost	\$1.5 Billion	\$650 Million	\$900 Million				\$400 Million	
FT Jobs	25	26	25		25	100	10	145
Construction Jobs	650	400	550		500	500	300	
Tax/Pilot	\$107MM over 30 years \$96.3 to town \$10.7 to county Average to town \$3.2MM / Yr	\$103MM over 30 years Average to City \$2.6MM / yr			\$30MM PILOT over 20 years Average to town \$1.5MM/yr	\$7.9 MM in State in Local tax per year	\$45MM Pilot over 30 years Average to City \$1.5MM/yr	\$4.75MM per year (or 3% of City budget) In past had paid as much as \$9MM per year
Other		Initially will pay \$25MM to City for easements, stadium imprv, environmental programs, workforce development					Of 300 Construction jobs, 60 will be apprentice jobs targeted to Bayonne residents	To ease economic effects, Dominion to pay \$1.75MM and State (RGGI) to pay \$1.2MM over 4 years aft close

Some Potential Options for a Developer of Natural Gas Fueled Combined Cycle Plant

- First Energy / JCP&L, not likely....
 - Control of site is key and removes a major hurdle if a sale doesn't have to be consummated, but...
 - Likely to be reluctant suitor:
 - Posturing to get best deal for land, or more likely...
 - Not in a hurry to introduce new capacity because existing generation and transmissions assets will benefit by shutdown of Oyster Creek
 - Lots of PA and OH generation sending electricity east
 - Transmission revenues will rise if Oyster Creek is not replaced
- Exelon?, also not likely.....
 - Interest in the past has been base load nuclear generation
 - Another player with both Midwest and PA generation and transmission assets which stand to become more valuable if Oyster Creek shuts down
 - With Constellation merger, more diversified generation portfolio, not sure if it has implications for a combined cycle natural gas load following strategy
- Best Bet: A non-traditional, emerging generator, who has demonstrated genuine interest in building new PJM generation:
 - Hess
 - Competitive Power Ventures
 - LS Power
 - NRG (maybe)
 - Probably someone not on this list but with similar characteristics

Oyster Creek Occupations (2006)

# of Employees	Key Occupations	Annual Pay Range
18	Power Line Installers and Repairers	\$50,000 - \$83,000
19	Purchasing Agents	\$50,000 - \$104,000
28	Trainers	\$64,500 - \$131,000
24	Management Analysts	\$64,500 - \$131,000
32	Electrical Engineers	\$50,000 - \$131,000
18	Nuclear Engineers	\$83,000 - \$131,000
46	Nuclear Engineering Technicians	\$39,500 - \$104,000
42	Maintenance & Repair Workers	\$39,500 - \$83,000
57	Nuclear Power Reactor Operations	\$39,500 - \$104,000
136	Support staff, managers, all other jobs.	
420		

Industry Sub-Sectors in Ocean County

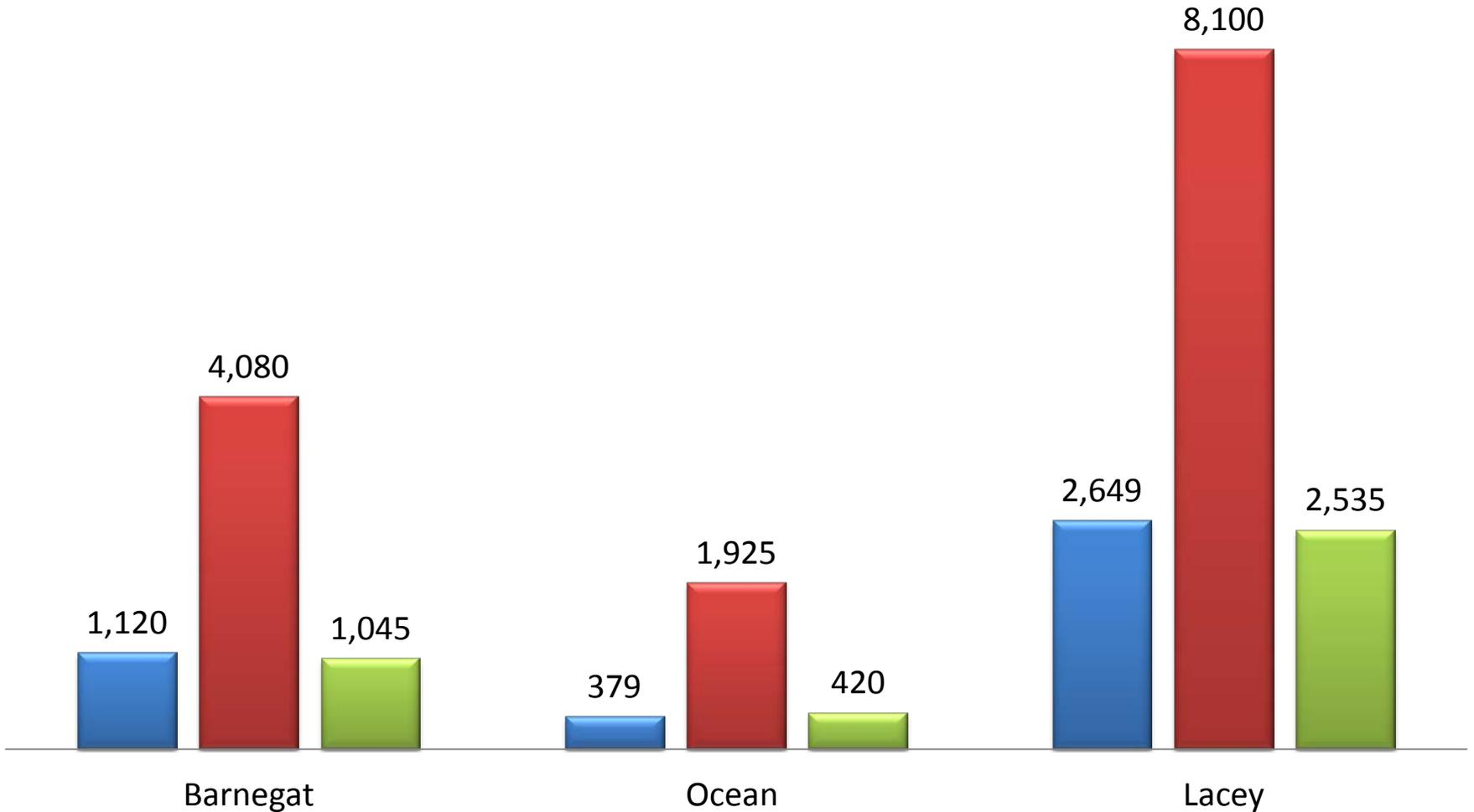
Fastest Growing Minor Industries in Ocean County by 2020				
Industry Title	2010 Estimated Employment	2020 Projected Employment	Numeric Change	Annual % Growth Rate
Health Care and Social Assistance	31,850	37,500	5,650	1.6
Retail Trade	25,600	27,500	1,850	0.7
Educational Services	17,700	18,550	850	0.5
Accommodation and Food Services	13,400	15,750	2,350	1.6
Self-Employed and Unpaid Family Workers, All Jobs	13,050	14,000	950	0.7
Professional, Scientific, and Technical Services	5,700	7,100	1,400	2.2
Administrative and Support and Waste Management and Remediat	5,500	6,500	950	1.6
Source: New Jersey Department of Labor and Workforce Development				
Long-term Employment Projections by Industry 2010-2020				

Ocean County Employment by Industry Projections (Super Sectors)

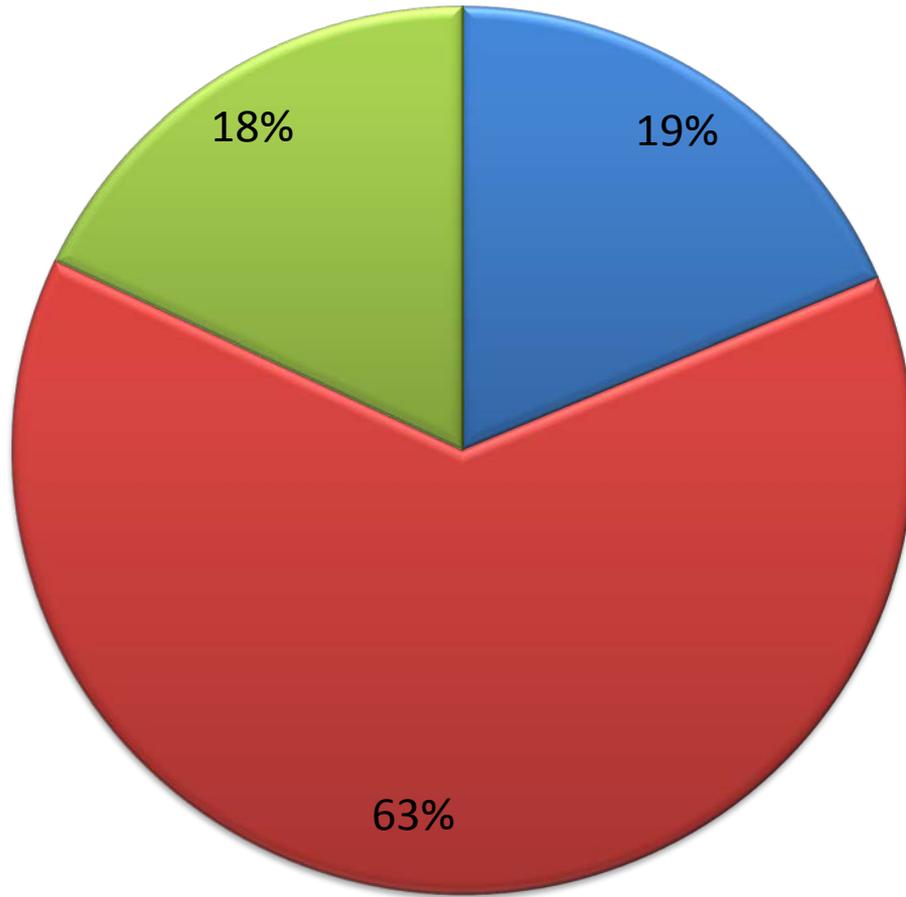
Fastest Growing Industries in Ocean County by 2020				
Industry Title	2010 Estimated Employment	2020 Projected Employment	Numeric Change	Annual % Growth Rate
Education and Health Services	49,550	56,050	6,500	1.2
Trade, Transportation, and Utilities	32,500	35,450	2,950	0.9
Leisure and Hospitality	18,950	21,800	2,800	1.4
Professional and Business Services	11,450	13,850	2,400	1.9
Construction	6,950	9,750	2,800	3.5
Other Services (Except Government)	6,800	8,050	1,250	1.7
Financial Activities	6,250	6,950	700	1.1
Source: New Jersey Department of Labor and Workforce Development				
Long-term Employment Projections by Industry 2010-2020				

Journey to Work Data

■ Total Employees In ■ Total Employees Out ■ Live where you work



Commute Patterns for all Three Municipalities



- Total Coming In: 4,148
- Total Going Out: 14,105
- Total Live where you work: 4,000