

Section 1. Benefits Overview

Chain Works District seeks to redevelop the approximately 800,000 sf. Morse Chain/Emerson Power facility, converting its 95-acre parcel into a mixed-use neighborhood intricately linked with the surrounding walkable neighborhoods. The site will be transformed from an idle industrial complex into a reinvigorated mixed-use neighborhood, including residential, commercial, office, and manufacturing space.

Phase 1 – the northern gateway – which this application hopes to fund, is the catalyst to jumpstart the site’s transformation into an urban neighborhood. Phase 1 includes 4 new buildings lining an urban street w/ sidewalks, renovation of 2 existing historic buildings and conversion an abandoned rail ROW into a bike/ped trail. The buildings will meet LEED criteria and include design that achieves a 70% reduction in fossil fuel use to comply with Architecture 2030. The site has been planned to incorporating green infrastructure and a high level of walkability based on LEED ND.

Section 2. Expected Annual Benefits by Close of CGC Project Period

Type	Metric	Direct	Indirect
RPM	Permanent Jobs Created (FTE)	1080	310
RPM	NYSERDA CGC Investment (\$)	\$3,000,000	N/A
RPM	Investment by Others (matching and leveraged)	\$38,000,000	\$100,000,000
RPM	Conventional Energy Savings (MMBTU/year)	17,053.96 MMBTU/year	N/A
RPM	Natural Gas Savings (therms/year)	5,457 therms/year	N/A
RPM	Grid Electricity Savings (KWh/year)	8,762,906 kWh/year	N/A
RPM	Gasoline Savings (gallons / year)	48,378 Gallons	64,142.54 Gallons
RPM	Conventional Energy Cost Savings (\$ / year)	\$1,074,539.58	N/A
RPM	GHG Savings (MTCDE / year)	1299.387838 MTCDE/year	2867.119429MTCDE/year
SCM	Renewable Electricity Created (MWh/year)	2312.64 MWh/year	N/A
SCM	Installed Solar/Wind/Geothermal Capacity (MW)	1.5 MW	N/A
SCM	Number of new LEED or Certified Buildings	1	2
SCM	Vehicle-Miles-Traveled (VMT) reduced (miles)	551,400 miles/year	2,092,835 miles/year
SMC	Revenue Generated by New or Increased Business	N/A	\$123,804,397/year

Methods and Assumptions:

General notes (applies to all metrics): All calculations for Benefits are based on the building area and planned usage with multipliers applied based on industry standards as noted below. Further benefits are likely but difficult to calculate precisely at this time. New buildings constructed in the neighborhood will magnify the estimated impacts on neighborhood connectivity, walkability, diversity and mix of uses, but details specific enough to measure are not yet available. Benefits will also accrue for adjacent residents, including increased walkability and reduced VMT, but this potential has not been quantified.

Permanent Jobs Created: Conservative estimate based on analysis of space consumption nationally and building area to be rehabilitated; the number of employees per unit of nonresidential space tends not to vary much by location (Nelson 2004). Assumes project is fully leased and creates 1 job per 280 sq. ft. of gross Office area and 550 sq. ft. of gross Manufacturing area. Construction and indirect job impacts are calculated using a Three Rivers Model and multipliers for total output, total earnings and total employment for Construction of 2.339, 0.7593 and 19.3875 and for Professional Sector (Office Space) of 2.0506, 0.7903 and 17.6334 respectively. Direct jobs = construction + employees. Indirect = result of jobs created due to multiplier on employee based total demand. (Bureau of Economic Analysis RIMS II)

Nelson, A. C. (2004). *Planner's estimating guide: Projecting land-use and facility needs*. Chicago: Planners Press, American Planning Association.

Conventional Energy Savings (MMBTU/year): Estimate based on U.S. EPA's Energy Star–Target Finder data collected by nationally representative surveys, such as DOE's Commercial Buildings Energy Consumption Survey (CBECS). The design goal is to reduce energy use over regional average (assumes conventional energy to be natural gas and grid electricity) for building type by 70% (Architecture 2030¹) and consumption per finished square foot (the baseline used is 98,000BTU/sq. ft. based on the 2003 U.S. EIA Middle Atlantic Commercial Building Survey, the most recent available.).²

Natural Gas Savings (therms/year): Assumption: natural gas represents 32% of total annual MMBTU;³ See above for total energy use estimate.

Grid Electricity Savings (KWh/year): Assumption: Electricity represents 68% of total MMBTU.⁴

Gasoline Savings (gallons / year): Gallons saved are based on VMT reduction per capita multiplied by new resident estimate. Assumptions: Average 2013 fuel efficiency - 23.5 MPG - US EIA. See VMT calculation.

Conventional Energy Cost Savings (\$ / year): Estimated Grid Electricity and Natural Gas savings multiplied by average 2013 price (\$0.1029/kWh and \$12.66/ 1,000 cu. ft., respectively).

GHG Savings (MTCDE / year): Based on estimated electricity, natural gas savings from buildings and gasoline savings from VMT reduction. MTCDE calculations based on EPA's Pollution Prevention Program's Greenhouse Gas Calculator and NYSERDA conversion factor for grid electricity.

Renewable Electricity Created (MWh/year): Assumptions: Annual average of 5 hours usable sun per day. See Installed Solar Capacity.

Installed Solar/Wind/Geothermal Capacity (MW): Assumptions: Half of all roof area is covered in solar panels, generating 8W per sq. ft. (the low range of industry estimate of 8-10W per sq. ft.).

¹ Architecture 2030, & 2030 Inc. (2008). *Meeting the 2030 challenge through building codes*. S.I.: 2030 Inc., Architecture 2030. Retrieved from: http://www.architecture2030.org/files/2030Challenge_Codes_WP.pdf

² 2003 U.S. EIA Middle Atlantic Commercial Building Survey. <http://www.eia.doe.gov/emeu/cbecs/2003sample.html>

³ Ibid

⁴ Ibid

Number of new LEED or Certified Buildings: All buildings will use LEED guidelines, at least 1 building will be Certified. The entire Chain Works District masterplan is currently pursuing LEED-ND Plan Certification. The publicity from the high level of integrated green features is expected to catalyze at least one other LEED project during the funding period and lead to greater market transformation in the future.

Vehicle-Miles-Traveled (VMT) reduced (miles): Assumes residential count based on 1.5 residents per 1000 Gross sq. ft. residential space. Neighborhood form results in 30% VMT reduction from county average VMT (*Growing Cooler, Ewing, et al.*), shows a 30% reduction in VMT and GHG emissions in walkable neighborhoods). Indirect impacts are based on employees and nearby residents having additional walkable amenities.

(County VMT * ⅓) * New population

Revenue Generated by New Business (\$/year): Calculated based on the total potential demand induced by employment in areas that will be built out under Phase 1. Using Three Rivers Model and locally appropriate multipliers for professional jobs.

Section 3. Potential for Future and/or Long Term Transformational Benefits

Type	Metric	by 5 years	by 15 Years	by 30 Years
RPM	Permanent Jobs Created (FTE)	1,573	1,961	2,114
RPM	NYSERDA CGC Investment (\$)	\$3,000,000	\$3,000,000	\$3,000,000
RPM	Investment by Others (matching and leveraged)	\$38,000,000	\$100,000,000	\$200,000,000
RPM	Conventional Energy Savings (MMBTU/year)	21,228	43,969	87,938
RPM	Natural Gas (therms/year)	67,930.46	140,701.34	281,402.68
RPM	Grid Electricity (KWh/year)	4,230,722	8,762,906	17,525,812
RPM	Gasoline Savings (gallons / year)	9,887	31,943	63,886
RPM	Conventional Energy Cost Savings (\$ / year)	\$521,320.74	\$1,074,539.58	\$2,149,079.16
RPM	GHG Savings (MTCDE / Year)	1,333	2,657	5,314
SCM	Renewable Electricity Created (MWh/year)	642.40	2312.64	4625.28
SCM	Installed Solar/Wind/Geothermal Capacity (MW)	0.4 MW	1.5 MW	3.1 MW
SCM	Number of new LEED or Certified Buildings	1	2	4
SCM	Vehicle-Miles-Traveled (VMT) reduced (miles/year)	232,350	661,304	1,322,608

Methods and Assumptions:

All benefits are measured based on the planned floor area of redeveloped buildings and their uses starting with the benefits from completing Phase 1 of the Chain Works District. By the end of the 5 year period, direct benefits from developing Phase 1 should be realized; by the end of the 15 year period, direct benefits from deep energy retrofit and conversion of the remainder of the existing Chain Works buildings are expected. The 30 year projection

assumes that the successful redevelopment and creation of a mixed use neighborhood center catalyzes additional new construction or renovation on-site or elsewhere that is at least equal in floor area to the District's historic buildings. Much of this catalyzed development is envisioned for the Chain Works parcel, but the quality of life improvements and competitive advantage for the greater Ithaca area that this project promises is likely to also spur development in other underutilized parts of the City including Inlet Island and the South West Commercial District. While market transformation is difficult to predict, the Chain Works project is well-timed for Ithaca. There is an overwhelming demand for more housing in the city, according to the Ithaca Urban Renewal Agency rental vacancy in Ithaca is less than 1%, which HUD describes as a rate indicating a severe housing shortage, and dense walkable neighborhoods already represent the highest real estate value per acre in the city.

Permanent Jobs Created: Based on building area to be rehabilitated assuming project is fully leased and creates 1 job per 280 ft of Office area and 550 ft of Manufacturing area. These are conservative estimates from Nelson, Arthur C. 2004. Planner's estimating guide.

Conventional Energy Savings (MMBTU/year): Based on design goal of reducing energy use over regional average for building type by 70% (Architecture 2030 Challenge) and consumption per finished square foot (baseline used is 98,000BTU/SqF; US EIA 2003 Middle Atlantic Commercial Building Survey). Assumption: Conventional Energy = Natural gas and Grid Electricity

Natural Gas Savings (therms/year): Assumption: natural gas represents 32% of total annual MMBTU; US EIA 2003 Middle Atlantic Commercial Building Survey, See above for total energy use estimate.

Grid Electricity Savings (KWh/year): Assumption: Electricity represents 68% of total MMBTU; US EIA 2003 Middle Atlantic Commercial Building Survey.

Gasoline Savings (gallons / year): Gallons saved are based on VMT reduction per capita multiplied by new resident estimate. Assumptions: Average 2013 fuel efficiency - 23.5 MPG - US EIA. See VMT calculation.

Conventional Energy Cost Savings (\$ / year): Estimated Grid Electricity and Natural Gas savings multiplied by average 2013 price (\$0.1029/kWh and \$12.66/ 1,000 cubic ft. respectively)

GHG Savings (MTCDE / year): Based on estimated electricity, natural gas savings from buildings and gasoline savings from VMT reduction. MTCDE calculations based on EPA's Pollution Prevention Program's Greenhouse Gas Calculator and NYSERDA required conversion factor for grid electricity.

Renewable Electricity Created (MWh/year): Assumptions: Annual average of 5 hours usable sun per day.

Installed Solar/Wind/Geothermal Capacity (MW): Assumptions: Half of all roof area is covered in solar panels, generating 8W per SqFt (low range of industry rule of thumb 8-10W per SqFt)

Number of new LEED or Certified Buildings: All buildings will target LEED Gold, at least 1 building will be Certified. The entire Chain Works District will follow LEED ND guidelines.

Vehicle-Miles-Traveled (VMT) reduced (miles): Assumptions: Residential count based on 1.5 residents per 1000 Gross SqFt. residential space. Neighborhood form results in 30% VMT reduction from county average (*Growing Cooler, Ewing, et al.*, shows a 30% reduction in VMT and GHG emissions in walkable neighborhoods). Reduced VMT in surrounding neighborhoods from the increase in walkability has not been calculated.

Section 4. Potential to Impact Regional and Local Sustainability Indicators

Indicator	In RSP?	Baseline (if known)	Brief one-line description of impact
Indicator 2: Capacity from NYSEDA-funded renewable energy installations.	Yes	N/A	Increase solar installed by 1.54 MW.
Indicator 5a: Proportion of Southern Tier residents who live in existing cities and villages.	Yes	Baseline (2010): 38%	Project converts 252,300 SqFt of vacant industrial space for residential development in the City of Ithaca. Phase 1 will have approximately 278 residents, 152 units, just a short walk from the core of downtown.
Indicator 5b: Land-use Patterns – Per capita land consumption	Yes	Baseline (2010): 0.10	Chain Works converts existing underutilized land to residential use and will reduce land consumption per capita using multifamily and mixed use buildings.
Indicator 11: Acres protected through NYS DEC and other public, nonprofit and private protected lands.	Yes	Baseline (2010): 246,326 acres (DEC Lands).	Chain Works will increase the amount of protected land in the region.

Methods and Assumptions:

General: This application is for project zoning and master planning, the benefits will accrue from the redevelopment that will only be able to proceed once the project is completed.

Indicator 2: In striving to meet the 70% fossil fuel energy reduction required by the Architecture 2030 Challenge, Phase 1 of the Chain Works District will include solar arrays on 50% of roof area generating upwards of 1670.24 MWh/year when fully built out. Based on projected estimates total capacity is expected to be 1.54 MW.

Indicator 5a: The City of Ithaca has had stagnant growth over the last 50 years while Tompkins County has doubled in population. The Chain Works District redevelopment will help slow or reverse that trend providing hundreds of new units in the City with potential for even more in the future Phases when new buildings are constructed alongside the existing industrial structures. Creating an exciting new district has the potential to create new demand for walkable housing, particularly lofts and other multi-family units.

Indicator 5b: The Chain Works District will add approximately 252,300 SqFt of residential space in the existing buildings and has the potential to add more than double that figure in new buildings. The district is aiming for an overall FAR of at least 0.8 while preserving a significant tract of open space at the south end of the district. Multifamily and mixed use buildings will significantly increase the efficiency of residential land use and reduce the land consumption per capita.

Indicator 11: The Chain Works District will protect more than 50 acres of sensitive habitat that has been identified as priority conservation area by the Town of Ithaca and Tompkins County.