

employment opportunities for RichmondBUILD, Richmond Workforce Investment Board (WIB) and RichmondBUILD graduates into the program model.

Reduction of Greenhouse Gas Emissions

The Richmond City Council has adopted ambitious greenhouse gas (GHG) reduction goals in an effort to prevent global climate change. The most recent GHG goal adopted by City Council commits to the GHG emissions targets established by California's Global Warming Solutions Act, or Assembly Bill 32 (AB 32). The GHG emission reduction targets outlined by the AB32 include:

- 1) Reducing to 2000 GHG emissions levels by 2010
- 2) Reducing to 1990 GHG emissions levels by 2020
- 3) Reducing to 80 percent below 1990 GHG emissions levels by 2050

In an effort to track and manage GHG emission levels, the City completed a greenhouse gas (GHG) inventory in 2009 for the 2005 calendar year. The GHG inventory found that the consumption of electricity resulted in 132,021 metric tons of carbon dioxide emissions annually. Since the 2005 GHG inventory was completed, City staff has obtained GHG emissions data from PG&E and have found that in some years, GHG emissions resulting from electricity in Richmond were continuing to increase. There are two methods by which Richmond could reduce GHG emissions resulting from the consumption of electricity:

- 1) Consume less electricity by implementing energy efficiency and conservation measures, and
- 2) Procure electricity with a higher renewable energy content such as solar, wind, etc.

City staff believes that both strategies are necessary to achieve the GHG reduction targets adopted by City Council.

The electricity supplied by the MCE has achieved much higher renewable energy content than PG&E and thus emits less greenhouse gas emissions into the atmosphere. MCE is providing electricity to its Light Green Customers that is 50 percent renewable energy. By comparison, in 2010 PG&E's electricity contained 15.9 percent renewable energy. Figure 5 demonstrates PG&E's 2010 electric power mix and Figure 6 demonstrates MCE's 2011 electric power mix.

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Figure 5 - PG&E 2010 Electric Power Mix (PG&E's 2011 Power Mix is not yet available)
Source: PG&E website
<http://www.pge.com/myhome/edusafety/systemworks/electric/energymix/>, retrieved 4/10/2012

PG&E Summary

- Nuclear generation (23.8 percent)
- Unspecified sources (22.9 percent)
- Natural gas (19.6 percent)
- **Renewable energy (15.9 percent)**
- Large hydroelectric facilities (15.6 percent)
- Coal (1 percent)
- Other fossil-based resources (1.2 percent)

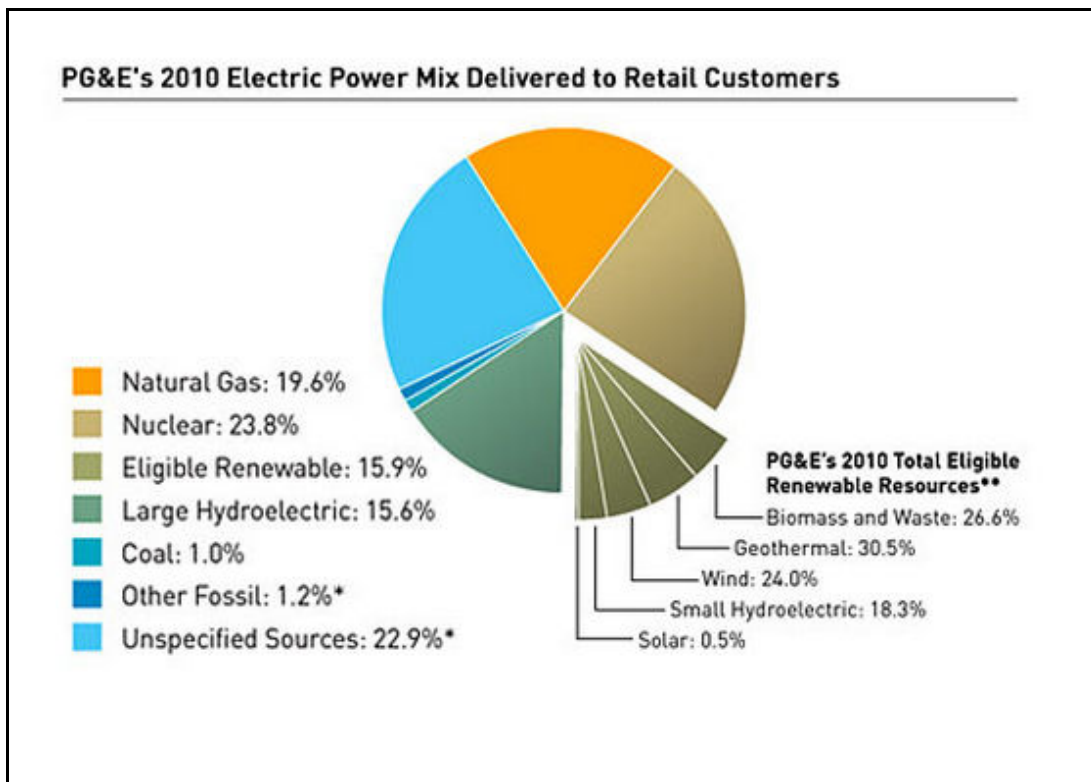
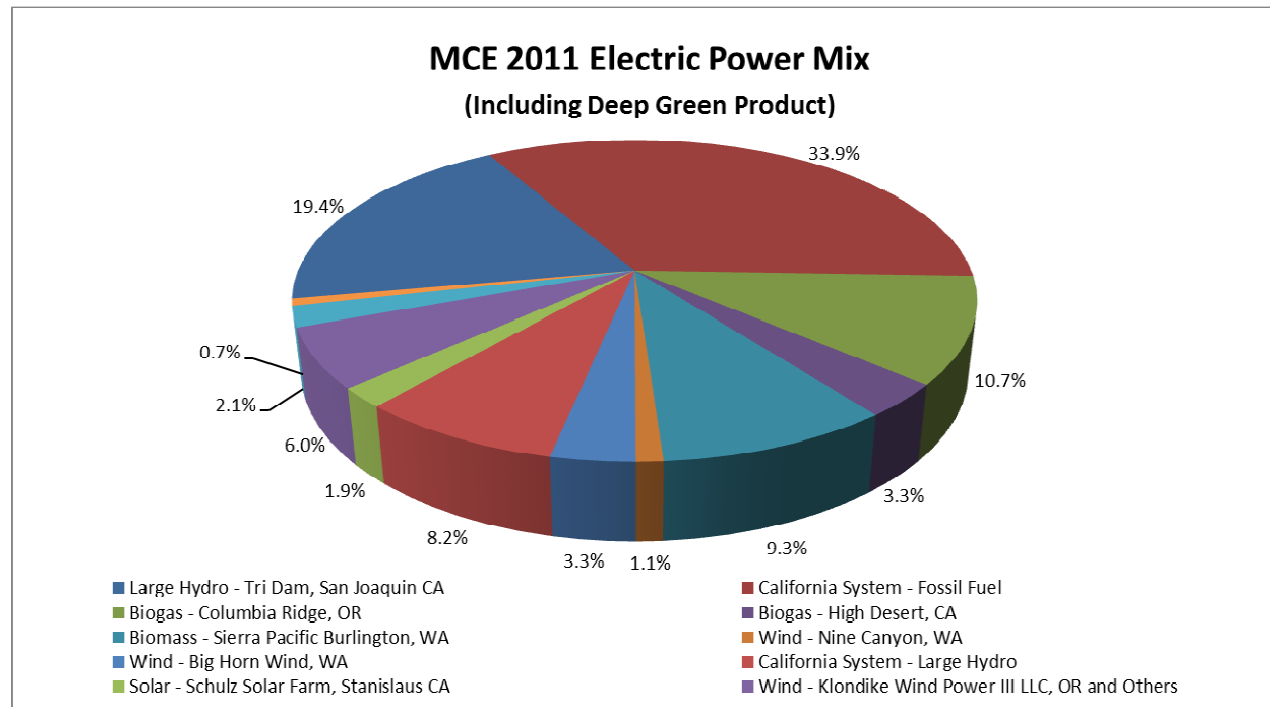


Figure 6 - Marin Clean Energy 2011 Electric Power Mix
 Source: Marin Clean Energy website (<http://marincleanenergy.info/power-sources>) and MEA staff, date retrieved 4/10/2012

MEA Summary Light Green Product Summary – 2011

MCE Light Green Energy Supply - 2011	Total Energy (MWh)	Percentage (%)
California Certified Renewable Energy Supply		
--Biomass	17,319	9.7%
--Landfill Gas/Biogas	26,004	14.6%
--Wind	6,731	3.8%
Other Renewable Supply (Including Renewable Energy Credits)		
--Solar - SSJID	702	0.4%
--Wind - Various Sources (Pacific Northwest)	8,223	4.6%
--Various Renewables - CA System Power System	1,331	0.7%
Carbon Free/Neutral Supply		
--Hydroelectric - SSJID (Tri Dam)	36,000	20.2%
--Hydroelectric - CA System Power	15,135	8.5%
--Nuclear - CA System Power	3,825	2.1%
Conventional Supply		
--Fossil Fuel - CA System Power	62,869	35.3%
Total Light Green Energy Supply	178,139	100.0%
California Certified Renewable Percentage (CPUC Reported)		28.1%
Total Renewable Procurement Percentage (Including Renewable Energy Credits)		33.1%



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Although PG&E procures significantly less energy from renewable energy sources as compared to MCE, it is important to note that PG&E procures a significant portion of its energy from sources such as nuclear. To better understand the quantity of greenhouse gas emissions emitted per unit of energy consumed, we must compare emissions factors between PG&E, MCE and general California System Power. An emission factor is the mathematical relationship between the quantity of pollution emitted per unit of electricity produced. MCE released its emissions factor for the 2011 calendar year. However, PG&E's emissions factors are typically released 12 to 15-months after the end of the calendar year. For that reason, PG&E recommends using a rolling 5-year average to estimate its 2011 emissions factor (source:

http://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf, date retrieved: 4/10/2012).

A GHG inventory quantifies the amount of greenhouse gases emitted into the atmosphere by activities in a defined area over a specific time period. Policy makers use GHG emissions inventories to track emissions trends, develop strategies and policies to reduce GHG emissions, and assess progress toward meeting reduction goals. The net GHG reduction of Richmond's participation in MCE is dependent on the defined area of the GHG inventory. City staff is providing estimated GHG reductions under two GHG inventory scenarios: 1) estimated reductions for the Richmond community; and 2) estimated reductions for the State of California.

Figure 7 provides comparative calculations of the estimated GHG emission reductions under the two GHG inventories if Richmond were to join MEA. The calculations assume that 20 percent of Richmond's total customer base of 516 GWh will choose to opt out of participating in CCA and result in a total electric demand of approximately 412.8 GWh for the Richmond community.

If the GHG emissions inventory were limited to the Richmond community, then Richmond's participation in MCE would result in an estimated annual reduction of 16,240 metric tons of GHG emissions. This net reduction is associated with replacing PG&E's electric power with "greener" power provided by Marin Clean Energy. This GHG reduction will be captured in Richmond's GHG inventory and will directly demonstrate the City's progress to meeting its GHG reduction goals.

If the GHG emissions inventory were expanded to include the State of California, then Richmond's departing electrical load could result in a more significant annual GHG emissions reduction of 88,297 metric tons. MEA recommends that the GHG emissions reductions resulting from participating in the MCE program are most accurately determined by using the emissions factor of the California System Electric System power mix that is currently not in contract and available for purchase by utilities on the "spot market". MEA assumes that the departure of Richmond's electric load from PG&E service would not result in PG&E reducing its non-emitting energy sources such as nuclear or hydroelectric production, but it would result in PG&E reducing their incremental purchases of electricity from the spot market. The electricity purchased on the spot market tends to come from power sources that are much more fossil fuel

intensive such as natural gas and coal and therefore emit a higher quantity of GHG emissions.

Figure 7 – Annual Greenhouse Gas Emissions Comparison

MCE GHG Emissions Summary for City of Richmond

Richmond's Assumed Electrical Load with MCE Electric Service	MCE 2011 Emissions Factor (Metric Tons of GHG / GWh)	Annual Emissions from MCE Power Source (Metric Tons)
412.8 GWh	221.1	91,270.1

Source: MEA

Resulting GHG Reductions for City of Richmond GHG Inventory

Richmond's Assumed Electrical Load Departing from PG&E	PG&E 2011* Emissions Factor (Metric Tons of GHG / GWh)	Annual Emissions from PG&E Power Source (Metric Tons)	Annual GHG Reduction Replacing PG&E with MCE Power (Metric Tons)
412.8 GWh	260.4	107,510.2	16,240.1

Source: PG&E, Retrieved 4/11/12. Per PG&E protocol, 2011 estimated using rolling 5-year average 2006-2010.

Resulting GHG Reductions for California GHG Inventory

Richmond's Assumed Electrical Load Departing from CA System Power "Spot Market"	Emissions Factor for 2008 CA System Power "Spot Market" (Metric Tons of GHG / GWh)	Annual Emissions from CA System Power "Spot Market" (Metric Tons)	Annual GHG Reductions by Reducing Demand for California System Grid "Spot Market" (Metric Tons)
412.8 GWh	435.0	179,568.0	88,297.9

Source: MEA staff with Environmental Protection Agency E-GRID 2007 Emissions Factors and CEC Power Source Disclosure Information (<http://www.energy.ca.gov/sb1305/>, date retrieved 4/11/12).

Synergy with Existing City Policy

The City Council has made the goal of preventing global climate change and increasing local renewable energy a top priority for the City of Richmond. By joining MEA, the City would expect to increase the renewable energy content of electricity consumed in Richmond and reduce the City's greenhouse gas footprint. Examples of City Council support of renewable energy and greenhouse gas reduction initiatives include:

- Policy EC3.A Community Choice Aggregation of the General Plan Update (2030) Climate Change Element encourages the City to *“Conduct an assessment to determine the fiscal and operational feasibility of partnering in Community Choice Aggregation. Collaborate with neighboring jurisdictions to support local efforts to expand the generation and use of energy from renewable sources while increasing revenue for City. The municipally owned utility should explore purchasing surplus electricity generated by private sources to encourage large warehouse and retail operators to add solar panels to the roofs of their buildings and maximize generation of renewable energy.”*
- On May 4, 2010, City Council passed a resolution opposing State Proposition 16 on the June 16, 2010, ballot, which would have required a two-thirds vote requirement for public electricity providers. City Council stated *“the City of Richmond wishes to support citizens' ability to opt for locally controlled public power by forming municipal utility districts or CCAs in Contra Costa County and communities throughout the state.”*