

# 2014 DEPARTMENT OF TECHNOLOGY CLIMATE ACTION PLAN

DATA YEAR: FISCAL YEAR 2012-2013

PREPARED BY: BRIAN ROBERTS

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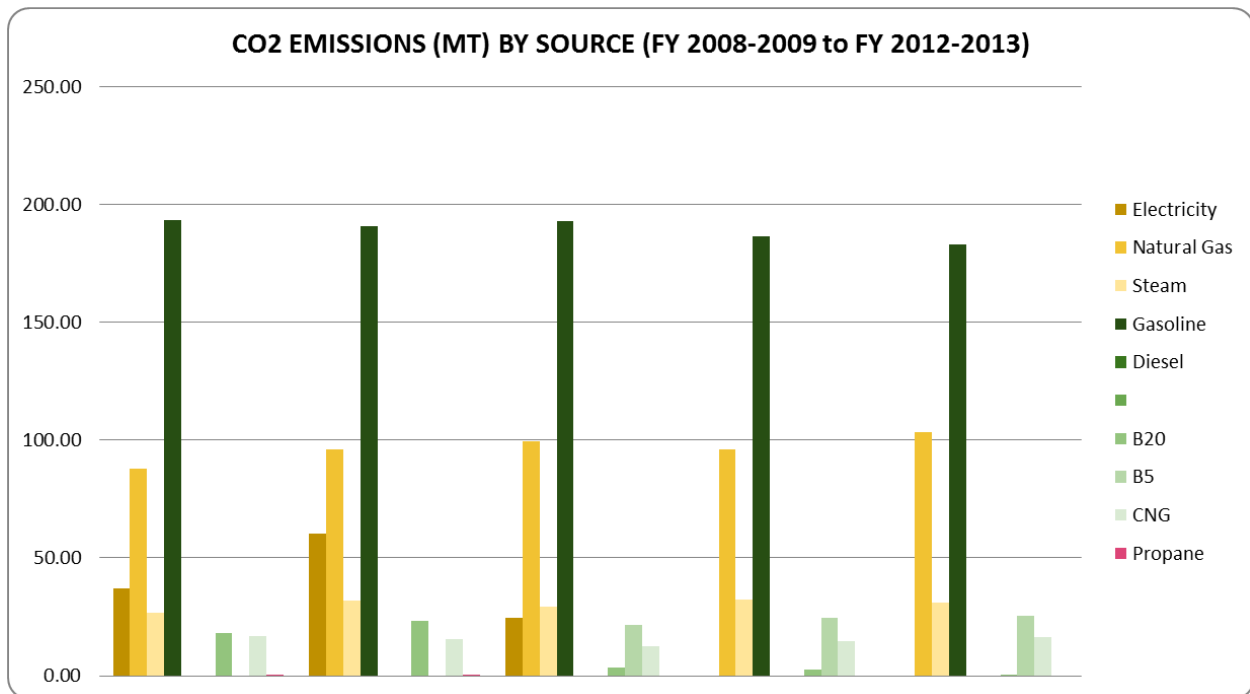
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## 1. INTRODUCTION

The Department of Technology (DT) plans a number of initiatives in the coming year to reduce greenhouse gas emissions. These measures include:

- Continue to consolidate data centers and virtualize servers to make the City's IT operations as energy efficient as possible.
- Create a more energy efficient Corporation Yard in the process of moving from our current site to a new site in Fiscal Year 2016, by implementing lighting and green building standards.
- Replacing part of our existing fleet of cargo vans with more fuel efficient vehicles over Fiscal Years 15-16 and 2016-17.

A summary of DT's CO2 emissions over the past 5 years can be seen below:



## 2. DEPARTMENTAL PROFILE

### 2A. DEPARTMENTAL MISSION

The mission for this department is to be an enterprise information and technology services organization that provides proactive leadership in the use of technology and information solutions to improve the City's operations and service delivery.

### 2B. DEPARTMENTAL BUDGET

DT's budget for 2013-14 is \$82,747,000.

### 2C. NUMBER OF EMPLOYEES

DT has 234 employees.

### 2D. FACILITIES

Insert text here.

Name	Address	Description
Headquarters	1 So. Van Ness Ave.	Administrative offices and remote "Command Center" for data center.
Temporary Corporation Yard	Jerrold Street	Management and field staff for inside wiring, outside plant and radio services. Will seek to move again to permanent location in FY16.
SFGTV	City Hall	Government cable channel operation
Data Center	200 Paul Ave.	Unstaffed shared space housing DT and other City servers.
SFO Data Center	SFO	Unstaffed City data center, DT operates together with SFO
DR Data Center	Rancho Cordoba	Remote disaster recovery data center where critical systems are replicated.
Central Radio Station	Twin Peaks	Operate public safety and other radio systems.

In addition to these facilities, DT from time to time installs and operates systems for client City departments. Examples include the Outdoor Public Warning system, the Community Camera network and the "Shot Spotter" pilot.

## 2E. VEHICLES

DT has 56 vehicles, 23 subject to the Healthy Air and Clean Transportation Ordinance (HACTO).

## 2F. DEPARTMENTAL CONTACT INFORMATION

Brian Roberts, e-mail [brian.roberts@sfgov.org](mailto:brian.roberts@sfgov.org), phone number 415-581-4061

## 2G. OTHER SUSTAINABILITY OR ENVIRONMENTAL PLAN

Not applicable

## 3. TOTAL ENERGY CONSUMPTION AND CARBON FOOTPRINT

DT's CO2 emissions have declined by 5% in the past 5 years and 15% since the peak in FY 2009-10.

FY 2008-2009 TO FY 2012-2013 ANNUAL DEPARTMENTAL CO2 EMISSIONS (MT)					
	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Total CO2 (mt)	<b>380.10</b>	<b>418.40</b>	<b>384.68</b>	<b>356.67</b>	<b>359.39</b>

## 3A. FACILITIES LIST VERIFICATION STATEMENT

The facilities list is accurate as of the close of Fiscal Year 2013. Since the close of FY 2013, DT has begun using a new data center at the San Francisco International Airport (SFO) the energy consumption is being separately metered and should be reflected in next year's CAP. In addition, during FY 2014 DT began operating a Disaster Recovery (DR) Data Center in Rancho Cordoba. Also in FY 2013-14 DT's corporation yard moved to a temporary building in Central Shops' Jerrold Street facility, we expect to be there until FY 2016 when we will move to a permanent location.

## 3B. FISCAL YEAR 2012-2013 FACILITIES ENERGY CONSUMPTION AND CARBON EMISSIONS

DT' facilities energy consumption is accurate for facilities that have a separate electricity meter. DT had electricity consumption at its 200 Paul Street Data Center which was not separately metered, so not included in the energy consumption and carbon emissions calculations

### 3C. 5-YEAR HISTORICAL ANALYSIS OF FACILITIES ENERGY CONSUMPTION AND CARBON EMISSIONS

DT's facilities electricity consumption has fallen by 44% and its carbon emissions 29 % from its peak in FY 2009-2010. The decline in electricity consumption is attributable in part to the closing of the City's primary data center at One Market Plaza which had separately metered power and corresponding transfer of data center functions to a new colocation facility at 200 Paul St., which does not have separately metered power for the area where the majority of DT's equipment is located.

FY 2008-2009 to FY 2012-2013 Departmental Facilities Energy Consumption					
Emission Source (Units):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Electricity (kWh)	3,468,349	3,484,760	2,879,457	1,880,847	1,930,282
Natural Gas (th)	16,537	18,127	18,781	18,128	19,470
Steam (lbs)	282,286	335,783	317,233	368,967	362,826

FY 2008-2009 to FY 2012-2013 CO2 Emissions from Facilities Energy					
Emission Source (mt):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Electricity	37.09	60.29	24.69	0.00	0.00
Natural Gas	87.76	96.20	99.67	96.21	103.33
Steam	26.89	31.98	29.32	32.28	31.10
<b>Total Facilities Energy CO2 (mt)</b>	<b>151.74</b>	<b>188.47</b>	<b>153.68</b>	<b>128.49</b>	<b>134.43</b>

Insert text here.

### 3D. VEHICLE LIST AND FUEL DATA VERIFICATION STATEMENT

DT has reviewed the vehicle and fuel data list and verified that it was accurate as of June 30, 2013. Since that time, DT has lost three vehicles due to the CNG tanks reaching the end of their allowable life.

### 3E. FISCAL YEAR 2012-2013 VEHICLE FUEL CONSUMPTION AND CARBON EMISSIONS

In 2013 DT consumed 20,760 gallons of gasoline, 2,643 gallons of B5 diesel and 2,690 gallon equivalents of CNG. This resulted in 225 metric ton equivalent CO2 emissions.

### 3F. 5-YEAR HISTORICAL ANALYSIS OF VEHICLE FUEL CONSUMPTION AND CARBON EMISSIONS

DT's consumption of its primary fuel, gasoline, has fallen 5.5% over the past 5 years resulting in a 1.5% decline in CO2 emissions.

FY 2008-2009 to FY 2012-2013 Departmental Fuel Consumption					
Fuel Type (Units):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Gasoline (gal)	21,961	21,643	21,917	21,167	20,760
Diesel (or equivalent) (gal)	0	0	0	0	0
B100 equivalent (gal)	0	0	0	0	0
B20 (gal)	2,222	2,891	436	301	27
B5 (gal)	0	0	2,255	2,543	2,643
CNG (GGE)	2,753	2,559	2,078	2,424	2,690
Propane (gal)	17	38	0	0	0

FY 2008-2009 to FY 2012-2013 CO2 Emissions from Mobile Fuel					
Emission Source (mt):	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Gasoline	193.42	190.62	193.04	186.43	182.84
Diesel (or equivalent)	0.00	0.00	0.00	0.00	0.00
B100 equivalent	0.00	0.00	0.00	0.00	0.00
B20	18.04	23.46	3.54	2.44	0.22
B5	0.00	0.00	21.73	24.52	25.48
CNG	16.81	15.62	12.69	14.80	16.42
Propane	0.10	0.22	0.00	0.00	0.00
<b>Total Mobile Fuel CO2 (mt)</b>	<b>228.36</b>	<b>229.93</b>	<b>231.00</b>	<b>228.18</b>	<b>224.96</b>

## 4. EFFORTS IN FACILITIES ENERGY REDUCTION

### 4A. ENERGY EFFICIENCY & RETROFIT PROJECTS

DT has no energy efficiency or retrofit projects. DT is seeking a permanent site for its Corporation Yard with radio repair space, warehouse and offices for field staff for fiscal year 2015-16. When the site is selected, we will evaluate for energy efficiency and retrofit.

### 4B. ENERGY BENCHMARKING & COMPLIANCE WITH THE ENERGY PERFORMANCE ORDINANCE

DT does not have any facilities which are subject to the energy benchmarking regime or the Energy Performance Ordinance.

Facility Type	# of Facilities Benchmarked for Department X per Facility Type	Page Number(s) in Benchmarking Report

Insert text here.

### 4C. COMPLIANCE WITH THE COMMERCIAL LIGHTING EFFICIENCY ORDINANCE

When DT moves into its new Corporation Yard in FY 2014-16, we will ensure that it complies with the Commercial Lighting Efficiency Ordinance.

### 4D. INFORMATION TECHNOLOGY

DT is engaged in a variety of initiatives intended to increase the energy efficiency of the City's IT operations while making them more reliable and robust.

Through the CIO (Chief Information Officer) Review process, the City's CIO actively monitors compliance with the City's "Environmentally Preferable Purchasing Requirements for Personal Computers and Servers" for all City departments' IT purchases. DT will work with the Committee on Information Technology (COIT) to update these policies originally approved in 2008.

All DT personal computers have power management features enabled so that they go into a standby mode when not in use. Prior to being put in use, DT's personal computer management team sets computers so that monitors and central processing units are put in standby mode after 20 minutes. These settings are subsequently locked, so that only a designated administrator may change them.

DT is actively engaged in two citywide initiatives designed primarily to improve the reliability of information technology, but that will also lead to greater energy efficiency: (1) the creation of a citywide data center and (2) citywide server virtualization.

The Airport has completed the construction of a new data center at the Airport in consultation with DT that will serve as a citywide facility. The new facility was designed to have power utilization efficiency (PUE) rating of less than 1.8. (The PUE is a data center industry metric that measures the ratio of power used for computing to the total power used by the data center. Other uses of power include cooling, lighting and other mechanical systems. (The lower the PUE, the more energy efficient the data center.) Specifically, the data center will incorporate:

- Energy efficient cooling system;
- The use of outside air economizers;
- Highly efficient uninterruptible power supply (UPS) system;
- Hot air containment system to evacuate the hot air and lower the amount of cold air required for the equipment;
- Panels to ensure that all the cold air is used to cool the equipment and does not bleed into the hot air;
- The electrical and UPS equipment is being installed in a manner to limit cooling of the mechanical systems;
- The size of the building itself has been reduced to the extent possible to lower any non-data center cooling requirements.

DT has evaluated over 1800 servers citywide to determine whether they can be virtualized and then to proceed with the actual virtualization.

Once moved into DT engaged in a major server virtualization project. Server virtualization allows applications to share computing resources over multiple servers. This allows a reduction in the number of physical servers. While servers operating in a virtualized environment tend to be more heavily utilized and use more energy and require greater cooling, overall there is a reduction in energy use.

#### 4E. RENEWABLE ENERGY

DT originally proposed wind power at its Twin Peaks Radio Facility in July 2008 and has been working with the PUC’s Renewable Generation group to achieve this goal. According to research by the California Energy Commission, Twin Peaks has the City’s best wind resource, so that the City could maximize its return on investment in wind power by installing a wind turbine at this location. In addition, the facility itself has high power demand consuming 691,080 kWh of electricity in FY 2011/2012. The facility is the central broadcasting point for the City’s public safety radio system which requires robust back-up power. DT has sought to use the wind turbine to supplement its battery and generator based back-up power arrangement.

The current plan is to install a 10 kW horizontal access wind turbine at the Radio Facility. DT would like to ensure that this valuable wind resource is utilized to its fullest potential and that the most productive possible turbine is placed in this area, consistent with the primary use of the site. In addition, DT is working with the PUC to ensure that this turbine continues to operate during a power outage to reduce DT’s reliance on back-up diesel generators at this critical public safety facility. The PUC has secured funding for a 10 kW turbine and is working on a final design for the project. However, DT has discovered that it will need to replace and strengthen its existing radio towers due to structural concerns; the wind turbine project will be put on hold to ensure that it is compatible with the long term use of the radio site.

#### 4F. GREEN BUILDING

DT plans to establish a new Corporation Yard with radio repair space, warehouse and offices for field staff in FY 2015-16. We are considering existing buildings and when a site is selected, we will refurbish in accordance with appropriate green building standards. (At the time last year’s Climate Action Plan was submitted, we had anticipated moving our Corporation Yard to a permanent site in FY 2013-14. However, the proposed site did not meet the Department’s needs, so we vacated our 901 Rankin Street facility and moved to a temporary location shared with Central Shops on Jerrold Street.)

### 5. EFFORTS IN WATER USE REDUCTION

#### 5A. WATER DATA VERIFICATION STATEMENT

We have reviewed the water data for FY 2012-13 and it is accurate.

#### 5B. FISCAL YEAR 2012-2013 WATER CONSUMPTION AND WASTEWATER DISCHARGE

In FY 2012-13, DT consumed 838,840 gallons of water and had wastewater discharge of 714,952 gallons.

#### 5C. 4-YEAR HISTORICAL ANALYSIS OF WATER CONSUMPTION AND WASTEWATER DISCHARGE

DT’s water consumption has declined by 14% since FY 2009-10 and 26% since its peak in FY 2010-11.

FY 2008-2009 to FY 2012-2013 Annual Water Consumption and Wastewater Discharge				
	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013
Water (gal)	971,162	1,131,806	849,749	838,840
Wastewater Discharge (gal)	850,218	1,000,432	739,204	714,952



## 5D. WATER CONSERVATION

DT has successfully reduced its water consumption and will continue these efforts during FY 2013-14.

## 6. EFFORTS IN VEHICLE FUEL REDUCTION

### 6A. COMPLIANCE WITH THE HEALTHY AIR AND CLEAN TRANSPORTATION ORDINANCE

DT has 52 vehicles, 24 of them are cars, light trucks and vans subject to Healthy Air and Clean Transportation Ordinance (HACTO). (DT had a fleet of three bikes through the City Bike program, but will contribute two of these to a 1 South Van Ness pool of vehicles.)

DT is seeking a waiver from its HACTO fleet reduction requirements because our expanding staff and broader geographical scope require additional vehicles. Starting on July 1, 2013 through the fiscal year we will increase staff by 40 FTE, a 20% increase in staff. The majority of those positions are in the Operations and Public Safety divisions require transportation for support of our key projects. These employees spend the majority of their time in the field and need vehicles to transport labor and materials to transient job sites.

Our primary citywide objectives include establishment of Data Centers at SF Airport, 200 Paul Street and the DR (Disaster Recovery) Center in Rancho Cordova (East of Sacramento). The SFO and Rancho Cordova data centers came on line in FY13-14 and are being populated with new systems in order to provide the City with more reliable and disaster resistant IT systems. The 200 Paul and SFO data centers are critical to the City's consolidation and virtualization projects which should lead to reduced energy consumption. SFO is a 14 mile drive and Rancho Cordova 114 miles. Data centers are "lights out" facilities where there is limited workspace, so in the critical early years while they are being populated with new systems, workers must travel back and forth. All locations require staff to carry equipment and server computer equipment with them. The Public Safety division is undertaking a four year project to install fiber (for high speed computer networks) and Wi-Fi throughout the City. This is a critical public safety and disaster recovery project for the City.

The DT automobile fleet has an average age of 14 years. We are faced with an increasing demand for services, while the fleet is losing vehicles due to mandated CNG tank aging and high maintenance costs.

### 6B. TRANSIT FIRST CAMPAIGN

DT has opted for a poster and e-communications Transit First Campaign for FY 2013-14 where each few weeks we will focus on a Transit First initiative. DT's order will be:

Early April – Pre-Tax Commuter Benefits Program  
Late April – Ride Matching  
Early May – Emergency Ride Home  
Late May – CityCycle or Bike to Work  
June – Public Transit at Work (Clipper Cards & Tokens)

### 6C. BIODIESEL

DT will explore the use of biodiesel in its fleet.

## 7. OTHER SUSTAINABLE PRACTICES

### 7A. ZERO WASTE

DT will continue to remind employees the different bins for recycling and composting and make sure each employee has an individual recycling receptacle.

### 7B. CARBON SEQUESTRATION / URBAN FOREST

Not applicable, DT does not manage property that could contribute to the urban forest.

### 7C. COMMUNITY WIDE IMPACT

DT is primarily an internal services department; however, there are two ways in which DT can have an impact in reducing community wide CO2 by supporting technologies that allow residents to access City services remotely or on-line rather than in person. DT currently supports technologies that allow residents to access services remotely or on-line. DT is seeking to expand municipal public WiFi and promote private investment in broadband.

An example of this is an urban telemedicine project DT is conducting with the Department of Public Health and University of California San Francisco. Under this project, the DT is providing deliver fiber to DPH operated community health clinics. Patients visiting the clinics would potentially have access to specialists at San Francisco General Hospital and UCSF as well as a pool of medical translators. The primary purpose of this project is to improve patient care; however, it has the associated benefit of reducing travel and associated CO2e emissions. A plan to expand this to all eleven community and jail based clinics is underway and nearly complete, with DT having provided to ten of the clinics.

### 7D. RESILIENCY AND ADAPTATION

DT is engaged in two initiatives to advance resiliency and adaptation: (1) fortifying the City's fiber network with diverse fiber routes and (2) the establishment of a remote data center in Rancho Cordoba for disaster recovery. DT is seeking funding to build more fiber routes so that network connectivity at any site can survive a break in any single route by automatically re-routing through an alternate path. DT is mirroring critical systems at the State of California's Rancho Cordoba data center so that these systems can continue to operate in the event of a disaster in the Bay Area.

## 8. REPORT SUMMARY AND DEPARTMENTAL CLIMATE ACTION GOALS

The Department of Technology (DT) plans a number of initiatives in the coming year to reduce greenhouse gas emissions. These measures include:

- Continue to consolidate data centers and virtualize servers to make the City's IT operations as energy efficient as possible.
- Create a more energy efficient Corporation Yard in the process of moving from our current site to a new site in Fiscal Year 2016, by implementing lighting and green building standards.
- Replacing part of our existing fleet of cargo vans with more fuel efficient vehicles over Fiscal Years 15-16 and 2016-17.

## APPENDICES

DT has no appendices to this report.