

Oracle White Paper
November 2013

Oracle's Environmental Accounting and Reporting Implementation

Driving Environmental and Financial Performance Improvements



| Oracle is committed to developing practices and products that help protect the environment

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Executive Overview

This white paper discusses how Oracle's Real Estate and Facilities (RE&F) organization implemented the Oracle Environmental Accounting and Reporting (EA&R) module to reduce its environmental impact, meet regulatory compliance requirements, and fulfill its responsibility towards the communities in which it operates.

Oracle's facilities portfolio spans more than 9 million square feet of owned real estate and 14 million square feet of leased space. The RE&F team strives to implement technology and best practices to reduce energy, water, waste, and minimize carbon emissions to reduce costs with the ultimate objective of increasing shareholder value. Enterprise wide goals have been set to achieve a 10 percent reduction in energy use, a 15 percent reduction in potable water, and a 15 percent reduction in waste to landfill on a per employee basis by 2016. Oracle has also set a goal to improve the Power Usage Effectiveness (PUE) of its data centers 6 percent by 2016.

The ability to track progress on these goals relies upon timely and accurate data. Prior to implementing Oracle Environmental Accounting & Reporting, the Real Estate & Facilities team relied on labor intensive manual processes using Excel spreadsheets to gather utility usage data. 100 employees across different geographic regions were deployed in the data collection process, followed by a 20-person week effort to validate the data, evaluate progress towards the set goals, and complete the facilities' related sections of the [Corporate Citizenship Report](#) and the Carbon Disclosure Project (CDP) submission. This lengthy process also generated inherent challenges in terms of auditability and data accuracy.

Oracle Environmental Accounting and Reporting (EA&R), a newly released add-on module to Oracle's Enterprise Resource Planning (ERP) system, was designed to address these challenges. By analyzing the costs of the current manual process, and the benefits that EA&R could deliver in terms of improved accuracy and reporting, Oracle was able to justify the internal implementation of this module.

Oracle EA&R has now been implemented and is used to capture and transform the data from Oracle's portfolio of 600 buildings across over 70 countries. The process of gathering data is now highly automated and requires only 5 people, representing a 95 percent reduction. This process improvement has significantly raised productivity while also ensuring data accuracy and auditability. The effort required to validate data and calculate progress towards goals has been reduced to 10 person weeks, a 50 percent reduction. The efficiency gains are projected to increase in the coming years as the processes are further streamlined. Expected annual cost savings related to electricity and natural gas consumption will amount to \$1.2 million.

In addition to EA&R automating environmental data capture, stakeholders now also have an increased set of reports to track performance against targets on an ongoing basis. The end result is that the Real Estate & Facilities team is able to drive continuous performance improvement and deliver business value across the organization.

Business Drivers

Taking account of its business needs, customer requirements, and the desire to minimize adverse impacts on the environment, Oracle maintains its facilities, runs its business operations and develops products in a responsible manner. As such, Oracle, with the cooperation of its employees, customers, contractors and suppliers, is committed to environmental management including¹:

- Managing the consumption of energy, water, paper and other resources used by Oracle in its day-to-day operations
- Identifying opportunities to divert, minimize, reuse and recycle our waste stream
- Incorporating environmental considerations into procurement processes
- Considering environmental issues when leasing or purchasing property
- Striving to reduce business travel and promoting alternatives wherever practicable
- Participating in efforts to improve environmental protection and the sharing of appropriate knowledge, methods and working practices
- Educating our employees about the steps Oracle is taking to help protect the environment and providing channels for employees to contribute to our efforts

To meet its commitment Oracle has set long-term goals to improve environmental performance for carbon dioxide emissions, energy, waste, and water. The goals are to achieve a 10 percent

Goals by 2016



Energy

- Consume 10% less energy per employee.*
- Improve power usage effectiveness in production data centers by 6%.*



Water

- Consume 15% less potable water per employee.**



Waste

- Divert to landfill 15% less waste per employee.**

* vs. 2010 for Oracle owned and leased buildings

** vs. 2012 for Oracle owned buildings

reduction in energy use, a 15 percent reduction in potable water, and a 15 percent reduction in waste to landfill per employee by 2016. With respect to data centers Oracle has a goal to improve Power Usage Effectiveness (PUE) 6 percent by 2016.

Climate change has become a strategic concern within many companies as a result of increasing pressure from multiple stakeholders including investors, NGOs, partners, customers, and the general public. As an example, today more than \$87 trillion of institutional investors are behind the Carbon Disclosure Project (CDP) annual sustainability survey of public corporations. The CDP is an international, not-for-profit organization that collects evidence and insight

¹ For more information on Oracle's Environmental policy please visit www.oracle.com/us/corporate/sustainability/environmental-policy-150366.html.

into companies' greenhouse gas emissions, water usage and strategies for managing climate change, water and deforestation risks².

Energy conservation, reduction in direct material usage, and building efficiency also positively impact Oracle's bottom line.

Growing Pains

By 2012, Oracle struggled with both system fragmentation and performance issues in its environmental performance analysis and reporting practice as a result of the complexity of Oracle's business and the company's rapid, acquisition-fueled growth. Measurement, management, analysis and reporting of greenhouse emissions and other sustainability information were a growing challenge.

Lengthy Manual Process and Fragmented Data

Given the scale of Oracle's occupied Real Estate portfolio – more than 600 buildings in 76 countries covering well over 20 million square feet – tracking environmental data sources required 100 Oracle users entering utility usage data manually into spreadsheets. Preparing figures for the Corporate Citizenship Report, the Carbon Disclosure Project Report and Oracle internal goals tracking also demanded 20-person weeks to validate and transform the data. Users also had to gather and validate data from the utility billing management system and Oracle Property Manager used to manage the properties. This practice was cumbersome and prone to errors, presenting numerous risks and limitations including data inconsistencies, limited and inflexible reporting capabilities, and lack of auditability. In many cases 3 rounds of validation were required to obtain reasonable confidence in the data.

From Manual Processes to Automation

In response to the growing challenges of environmental reporting Oracle decided to implement Oracle Environmental Accounting and Reporting (EA&R), a newly released add-on module to Oracle's Enterprise Resource Planning (ERP) system.

Environmental Accounting and Reporting enables organizations to track their greenhouse gas (GHG) emissions and other environmental data against reduction targets, and facilitates environmental reporting for both voluntary and legislated emissions reporting schemes. The solution manages this function from within the existing ERP system and utilizes Oracle Business Intelligence to provide immediate insight into an organization's environmental data to identify and manage CO2 and cost reduction opportunities – providing a rapid return on investment. Environmental Accounting & Reporting extends the capabilities of both the Oracle E-Business Suite and the JD Edwards EnterpriseOne family of applications.

² More information on CDP is available at www.cdproject.net.

The functional capabilities of Environmental Accounting and Reporting matched Oracle's internal requirements for process automation, improving data accuracy, and complying with global reporting schemes. The primary goal of the implementation was to enable the organization to track its GHG emissions for owned and leased facilities and track water and waste per employee to meet its internal goals. The project also included a business intelligence component to meet the increasing reporting demand from internal and external stakeholders.

Defining the Strategy

As with all software solution implementations, the EA&R project started with the engagement of the key stakeholders and presentation of the business case. Given the strong need to support internal sustainability goals and simplify the process undertaken to record, calculate and report utility usage and emissions, the business case focused on automating the process and increasing data accuracy to help drive business performance improvement.

A critical element to a successful implementation is the agreement on the scope of the project so it is essential to engage key stakeholders early on. Regular meetings were held at Oracle to determine the scope and requirements definition, engaging a cross-functional team that included real estate, energy directors, data center operations, sustainability management team, travel, corporate citizenship, and IT. A detailed review of product functionality was performed, comparing the EA&R capabilities to Oracle's requirements and understanding product functionality with the objective of minimizing customizations and standardizing the process using best practices. Requirements were defined from a global as well as a local perspective – with the awareness that identifying requirements for a particular region or country too late in the process would have caused delays or missed opportunities. Having visibility to regional and country level requirements and initiatives is invaluable when deciding upon a standard process for gathering, validating, calculating, and reporting on usage and goals. Finally, a key aspect of the strategy included the definition of metrics and key performance indicators to identify measurable results.

Implementation Highlights

The project scope covered environmental data sources spanning more than 600 buildings in more than 70 counties, for a total of 24 million square feet. The initial focus of the real estate organization was electricity, natural gas, water and waste. EA&R automatically calculates the associated greenhouse gas (GHG) emissions using the GHG Protocol framework as provided by the World Resources Institute (WRI). Now that the first phase of the implementation is completed, the solution could also track additional environmental sources such as company cars, business travel and other sources of scope 3 emissions if the organization decided to expand the scope.

The project included the implementation of integration flows with Oracle's utility billing management system, Oracle Property Manager, Inventory (units of measure, classes, and conversions), and Human Resources (locations, location code, and hierarchy), as shown in

Figure 1. Data integration from Oracle Property Manager included operating units, building location codes, building type, leased versus owned status, disposition type, tenure, square feet and head count. Data from Oracle's utility billing management system included supplier name, operating unit, service code, location code, product type, UOM, quantity, and total bill days.



Figure 1 : Key Data Components of the Implementation

With the initial implementation a data load through Web Applications Desktop Integrator (WebADI) was also required to leverage historical data as a baseline for performing trend analyses. In that light a key component of the project was also the implementation of Oracle Business Intelligence Enterprise Edition (OBIEE) to provide end users with reports and dashboards.

Once the team understood the requirements and goals from a global and local perspective and had defined standard processes, clear scope and goals were set for the implementation. A conscious effort was made to keep all business scenarios as per the scope during the conference room pilot stage, breaking down the implementation into phases as necessary. The software solution enables data capture, calculations and reporting across multiple factors, but it is still necessary to identify all relevant sources of environmental impact, related emissions factors, suppliers and their level of disclosures, and sites to be included in the system that may be unique to the organization. Business users created setup and sample transaction data to ensure that the capture of the usage data and associated emissions calculations met Oracle's functional needs. Once the proof of concept was successfully completed the setup for EA&R

was completed including units of measure conversions, environmental sources, suppliers, emission factors, and facilities data. The majority of the setup was a one-time activity with only minimal setup maintenance needed on an ongoing basis. The embedded nature of EA&R enabled the implementation team to leverage existing data sources, integration points, and business processes which minimized the time required to implement.

As a final step historical data was loaded into EA&R using its native data upload capabilities. Prior to go-live a comprehensive end-to-end user acceptance testing round was performed. The total technical portion of the implementation was completed within 6 months.

Data validation was performed throughout the project implementation. Training of key users was also planned at an early stage to educate the users on the product capabilities.

Dramatic Improvements

The implementation was successful with a smooth go-live as per the planned schedule without any major issues being reported. More than 35,000 records were successfully migrated from different sources as part of the initial data upload. Regular reviews with key stakeholders enabled any necessary corrective actions to be taken and ensure that best practices and processes were put in place in order to successfully track the environmental metrics and drive positive results.

The benefits of implementing Environmental Accounting & Reporting are multi-faceted. Moving away from manual data entry to automated feeds has dramatically improved data accuracy.

Better, Faster, Cheaper

Support for Growth, Data Accuracy, Efficiency, Timeliness, Auditability, Visibility

Spreadsheets

EA&R

Reporting time reduced by 50%

What once required more than 100 users manually entering data into spreadsheets is now achieved with only 5 people analyzing the data, a 95 percent reduction. The number of person weeks spent compiling metrics for Oracle's internal goals and Carbon Disclosure Project reporting went from 20 to 10 person weeks. It is expected that these numbers will decrease even

further going forward as the process is further streamlined.

EA&R's configurable dashboards also provide real time indicators of progress against the goals aggregated to the corporate level. Sustainability managers can now see Oracle's emissions tracking over years, quarters or months, checking sources and monitoring not only energy usage but also consumption of natural gas, water, and waste production. The timely visibility of data enables better decision making and identifies opportunities to reduce usage and costs.

For facility managers and regional department heads, the building level data screens provide the in-depth data they need as can be seen in Figure 2. By selecting criteria such as year, organization level and emission source, they immediately have data at whatever level is desired for any ongoing or ad hoc analysis.

Level 04 Organization	CO2-e Quantity	CO2-e UOM	CO2-e Quantity %
Broomfield - Eldorado Bldg 2	888888888888	KG	13.87%
Austin - Data Center	888888888888	KG	12.92%
West Jordan - Data Center	888888888888	KG	8.89%
Santa Clara - 4110 Network	888888888888	KG	5.28%
Hyderabad - CG North Wing	888888888888	KG	3.81%
Redwood Shores - 100 Oracle	888888888888	KG	3.62%

Figure 2: Building Level Data as a Percentage of Total Emissions

In the example in Figure 3, the facility manager for Sydney, Australia can see how natural gas and electricity used in their building is tracking year-over-year. They can also drill down further to see monthly data. This enables monthly data verification, identifies billing errors in a timely manner, and allows for analysis and adjustment to take place in real time. Users are able to trace each data point back down to the original transaction in EA&R.

							Usage Quantity		
							2011	2012	2013
Level 01 Organization	Level 02 Organization	Level 03 Organization	Level 04 Organization	Level 04 Organization Code	Emission Scope	Source Name	Usage UOM		
Oracle Corporation	APAC	APAC_ANZ	Sydney - North Ryde	SYDNEY	1	NATURAL GAS- ENERGY UNIT	Kilowatt Hour	8888888888	8888888888
Oracle Corporation	APAC	APAC_ANZ	Sydney - North Ryde	SYDNEY	2	ELECTRICITY	Kilowatt Hour	8888888888	8888888888

Figure 3: Usage by Year per Building

The Oracle Business Intelligence dashboards also enable tracking against stated key performance indicators on a normalized basis. Figure 4 shows electricity consumed per full time employee in a selected building. Using building headcount data from Oracle Property Manager and electricity usage data for the building, Oracle Business Intelligence (BI) calculates the electricity consumed per occupant, a calculation that was previously done manually. Users are now able to manage to targets on an ongoing basis as well as benchmark against other similar facilities in order to drive a process of continuous improvement.

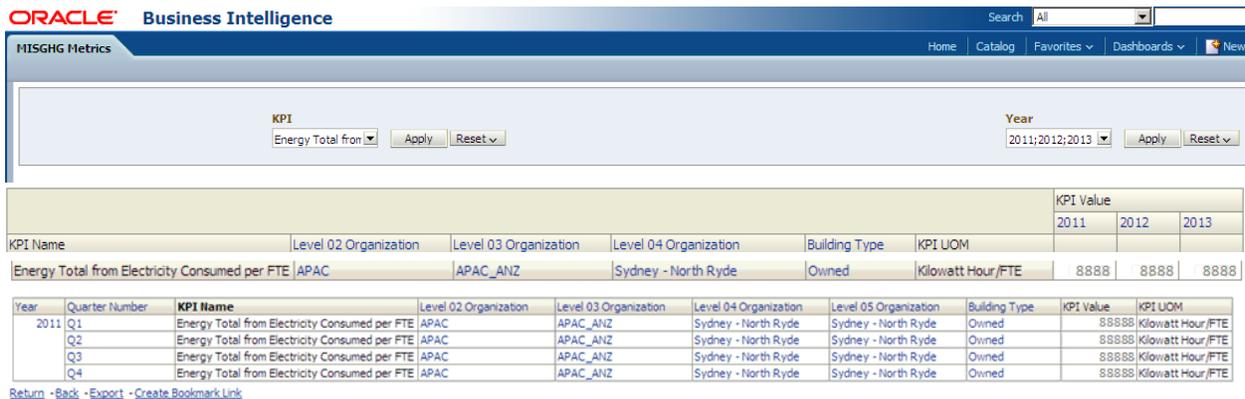
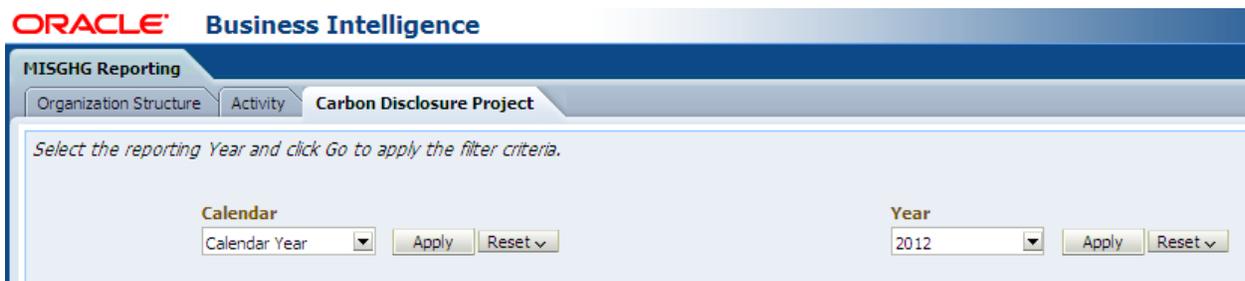


Figure 4: KPI - Energy Total from Electricity Consumed per FTE

Figure 5 illustrates how the dashboards provide the quantitative data needed for Oracle to submit to the Carbon Disclosure Project (CDP) on an annual basis. The BI pre-formatted CDP dashboard enables the Sustainability Manager to select the year to display the relevant data. EA&R also enables an organization to look at emissions factors by location, allowing the company to consider carbon emissions in future site selection, enabling the organization to better adapt and scale to changing business conditions. The team is now able to spend more time analyzing the data and working on initiatives to reduce emissions.

Expected annual cost savings related to electricity and natural gas consumption amount to \$1.2 million.



9.2a Gross Scope 1 emissions by business division

Company	Division	CO2-e Quantity	CO2-e UOM
Oracle Corporation	APAC	888888	MT
	EMEA	888888	MT
	HQ	888888	MT
	LAD	888888	MT
	NAM	888888	MT
Grand Total		888888	

Figure 5: Quantitative Responses to the CDP Report

Conclusion

The ability to track progress on goals relies upon timely and accurate data. Prior to implementing Oracle Environmental Accounting & Reporting, the Real Estate & Facilities team relied on labor intensive manual processes using Excel spreadsheets to gather utility usage data. 100 employees across different divisions were deployed in the data collection process, followed by a 20-person week effort to validate the data, evaluate progress towards the set goals, and complete the facilities' related sections of the Corporate Citizenship report and the Carbon Disclosure Project (CDP) submission. This lengthy process also generated inherent challenges in terms of auditability and data accuracy.

These costs and challenges created a compelling business case to implement Oracle Environmental Accounting & Reporting, a new module of Oracle E-Business Suite and Oracle JDEdwards EnterpriseOne.

Oracle EA&R has now been successfully implemented and is used to capture and transform the data from Oracle's portfolio of 600 buildings across over 70 countries. The process of gathering data is now highly automated and requires only 5 people representing a 95 percent reduction. This process improvement has significantly raised productivity while also ensuring data accuracy and auditability. The effort required to validate data and calculate progress towards goals has been reduced to 10 person weeks, a 50 percent reduction. The gains in efficiency are expected to be even higher in the coming years as the processes are further streamlined. Expected annual cost savings related to electricity and natural gas consumption amount to \$1.2 million.

In addition to EA&R automating the processes involved in capturing the data needed to measure the organization's environmental performance, stakeholders now also have an increased set of reports available which help drive continuous performance improvement and deliver business value across the organization.

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Author: Elena Avesani

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Contributing Authors:
Amy Aves, Jenni Grant

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Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA
94065
U.S.A.

Hardware and Software, Engineered to Work Together

Worldwide Inquiries:
Phone:
+1.650.506.7000
Fax: +1.650.506.7200

oracle.com