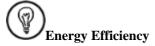
## Appendix E: An Overview of Toyota Motor Sales USA – South Campus Facility's High-Performance Green Principles





The solar panel roof system also serves as a cooling effect to reduce the "heat island effect," in which dark, heat-absorbing buildings and paved areas make the air in urban areas hotter and smoggier. A central plant system with a natural gas-powered system that circulates hot or cold water through pipes in the ceilings generates heat and A/C. Although slightly more costly compared to a traditional rooftop heating and cooling unit, it uses significantly less energy and helps eliminate the use of hydrochloro-fluorocarbons (HCFCs), which are thought to contribute to the greenhouse effect. Windows on the south side of the building are glazed with low-emission glass<sup>70</sup> and slightly inset into the concrete wall to provide interior shade. Other features include a utility metering system and a thermally insulated, double-paned glazing.

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A clear glass with a thin coating of metal oxide that allows the sun's heat and light to pass through the glass into the building. At the same time it blocks heat from leaving the room, reducing heat loss.





The West Basin Municipal Water District and the city of Torrance collaborated to extend the existing recycled water lines one half-mile to the South Campus for use in toilets, the central plant's cooling towers and landscaping irrigation. Potable water consumption is reduced by 81% by using low-flow fixtures and recycled water. Waterless urinals will save about 70,000 gallons of water annually. The complex is expected to conserve more than 11 million gallons of drinking water per year.<sup>71</sup>

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 $<sup>^{71}\,</sup>$  Toyota Motor Sales, U.S.A., Inc. Press Release. "South Campus Facts for Publication".

## Materials



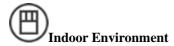
With the production of cement for concrete accounting for 2% of the world's annual energy resources, Toyota chose to use materials with recycled content. During construction, Toyota recycled 96% of waste generated the project. In from addition, more than 80% of the construction materials contain

recycled content. For instance, all structural steel is made from recycled materials, mostly from automobiles. Materials used to build the office – from the foundation to the ceiling tiles – have a recycled content of approximately 50%. Recycled carpet and other low-emitting materials such as paints, adhesives and wood composites were selected to avoid "off-gassing" (the release of chemicals from non-metallic substances under ambient or greater pressure conditions) from new fabrics and plastics. Composite wood products are free of urea-formaldehyde resins. Carpeting meets or exceeds the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program that limits off-gassing from those interior features. Sixty-two percent of the wood used in construction and interior finishes such as doors was crafted from Forestry Stewardship Council (FSC) certified wood. Elevator hydraulic fluid is non-petroleum-based, derived from vegetable oil. Lobby seating is furnished with chairs made of recycled automotive seat belts. In addition, 20% of the materials used were manufactured locally, cutting down on shipping and distribution expenses.





Water-efficient landscaping such as drip irrigation, wider plant spacing, and the use of low maintenance drought-resistant native plants and trees reduce the overall water demand by 60% over a traditional system. The campus wide drip irrigation system uses reclaimed water rather than potable water. The parking lots and garden court walking paths were paved with recycled concrete slabs used as casts for building walls. The site's perimeter is heavily planted with trees to provide shade for pedestrians and minimize heat islands. For associates, a campus-wide jogging trail was created, and outdoor spaces were incorporated into the landscaping to hold typical indoor functions outside and help unite the north and south areas of the campus.



Lobby-based glass stairwells were built to encourage workers to use them more frequently over the use of elevators. Amenities such as bike racks for 106 bicycles and 14 showers encourage staff to bike to work. Toyota selected paints and adhesives that meet the volatile organic compounds set by the South Coast Air Quality Management District. Adhesives, carpeting and paints contain zero or low emissions.

The buildings are free of formaldehydes and HCFCs. Housed in separate rooms, copy machines are equipped with separate ventilation systems to keep toner fumes out of the workplace. Janitorial facilities are also separated and have their own ventilation systems to keep chemical contaminants from affecting the interior air quality. Over 90% of the associates have exposure to natural daylight and views of the outdoors. These green improvements contribute to better indoor air quality, temperature, acoustics and work environment lighting and translate into tangible results in terms of staff comfort, greater job satisfaction and morale.

**Appendix F: Overview of Case Study Loan Programs** 

	Iowa	New York	Oregon	
Administrator	Iowa Energy Center	NYSERDA	Oregon Office of Energy	
Funding Mechanism	Revolving Loan	Public-Benefits Fund	Bond Issue	
Lending Organization	Participating private lenders	Participating private lenders	Oregon Office of Energy	
Eligible Technologies	Solar, Biomass, Wind, Small Hydroelectric	Solar, Wind, Energy Efficiency	Solar, Wind, Biomass, Hydro, Alt. Transportation Fuels, Geothermal, Waste, Cogen. Waste Heat Recovery, Recycling, Energy Conservation	
Eligible Recipients	All sectors except nonregulated utilities	Residential, Multifamily, Commercial, Industrial, Agricultural, Nonprofit	Residential, Commercial and Industrial, Schools, Government, Utilities, Tribes, and Nonprofits	
Incentive Amount	50% of the project cost financed at 0%; 20 yrs.	4.5% below market rate; 5-year term	\$20,000 - \$20 million; 10 - 15 yrs	
Maximum Limit	\$250,000	\$500,000 (\$5 million for multifamily projects)	No Limit	
Effective Date	1996	2000	1981	
Expiration Date	None	6/30/03	None	
Funding	\$5.9 M initial funding; revolving account	\$1.9 M per year	\$100 M bond authority/ biennium	
Amt. Disbursed	\$3.3 M	\$1.2 M (~\$10K for PV)	\$291 M (\$180 M for renewables)	
# of Loans	22	260 (4 for renewables)	530 (175 for renewables)	
Renewables Installed	~477,000 MWh annual generation	~8 kW	446 GWh annual generation; million MMBTU saved	

Source: North Carolina State University, National Renewable Energy Laboratory

http://www.nrel.gov/docs/fy02osti/32819.pdf

Appendix G: Overview of Case Study Buy-Down Programs

	Florida	Illinois	New York
Administrator	FL Solar Energy Center	IL Dept. of Commerce and Community Affairs	Two individual PV distributors contracted by NY State Energy Research & Development Authority
Eligible Technologies	PV	Solar Thermal, PV, (grant also includes Wind, Biomass, Hydro, Fuel Cells)	PV
Eligible Recipients	Commercial, Residential, Construction, Utilities, Schools, Government	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government	Residential
Buy-down Amount	\$4/watt; additional \$2,000 for builders	50% - 60% (\$6/watt for PV)	\$3/watt up to 50%
Maximum Limit	Maximum Limit \$16,000 residents; \$40,000 Reb. comm./public facilities Gran		\$7,500
Effective Date	tive Date 1999 1999		1999
Expiration Date	1/2002; currently inactive	12/2007 undergoes review	12/31/02
Program Funding	\$600,000 for 3 years	~\$5M per year through '07	\$1M for 3 years
Buy-down \$ Distributed	\$525,000 in rebates	\$8M (\$4.25M for PV)	Not available
Capacity Installed	173 kW	24 MW (693 kW for PV, ~130 kW for resid./comm.)	70 kW (+130 kW planned for summer 2002)

Source: North Carolina State University, National Renewable Energy Laboratory

http://www.nrel.gov/docs/fy02osti/32819.pdf

Appendix H: Overview of Case Study Tax-Credit Programs

	New York	North Carolina	Oregon (Personal)	Oregon (Corporate)
Туре	Personal	Personal and Corporate	Personal	Corporate
Administrator	NY State Dept. of Taxation and Finance	NC Dept. of Revenue	OR Office of Energy	OR Office of Energy
Eligible Technologies	PV	Passive and Active Solar, Wind, Biomass, Hydroelectric	Solar, Wind, Renewable Fuel Vehicles and Charging/Refueling, Geothermal Electric, Fuel Cells, Energy-Efficient Appliances, Duct Systems, Heat Pumps, Condensing Furnaces, and Boilers	Solar, Wind, Biomass, Hydro, Geothermal, Renewable Transportation Fuels, Energy Conservation, Weatherization, Recycling, Less- polluting Transportation Fuels, and Sustainable Buildings
Eligible Recipients	Residential	Residential Commercial Industrial	Residential	Commercial
Credit Amount	25%	35%	Varies by technology	35% of costs above conventional technology
Maximum Limit	Lesser of \$1.50/watt and \$3,750	\$1,400 - \$250,000	\$1,500	\$10,000,000
Enacted Date	1997	1977; revised 1994, 1999	1977	1979
Effective Date	1998	2000 (current program)	1978	1980
Expiration Date	None	1/1/06	None	None
Legislation	1997 NY Statutes 8660A	NC General Statutes 105-129.16A	OAR 330-070-0010 to 330-070-0097	OAR 330-090-0105 to 330-090-0150
Avg. # of Claims/yr.	95	50 in year 2000	871 (renewables)	25 (renewables)
Total Amount Claimed/yr.	\$124,000	\$53,261 in year 2000	\$931,000 (renewables)	Not available

Source: North Carolina State University, National Renewable Energy Laboratory

http://www.nrel.gov/docs/fy02osti/32819.pdf

## <u>Interview</u>

Ms. Amy Domini. September 20, 2004. Domini Social Investments. Founder and CEO. Providence, Rhode Island.

Mr. Paul Hilton. September 28, 2004. Dreyfus Corporation. Portfolio Manager. New York City, New York.

Ms. Michelle Moore, Vice President of Operations and Strategic Planning for U.S. Green Building Council. November 30, 2004.

Ms. Evelyne Slavin. August 20, 2004. Natural Resources Defense Council. Environmental Action Center Associate. Santa Monica, California.

Mr. Sandford L. Smith, A.I.A. August 17, 2004. Toyota Motor Sales, U.S.A., Inc. Corporate Manager Real Estate and Facilities. Torrance, California.

Mr. Robert K. Watson. August 20, 2004. Natural Resources Defense Council. Director, International Energy Project. Santa Monica, California.

Mr. Mark Yamauchi. August 17, 2004. Toyota Motor Sales, U.S.A., Inc. Facilities Operations Manager. Torrance, California.

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