

ENVIRONMENTAL SOLUTIONS WITH ECONOMIC VALUE



*Bringing energy  
and the environment  
into harmony.<sup>SM</sup>*

**DRESSER-RAND<sup>®</sup>**

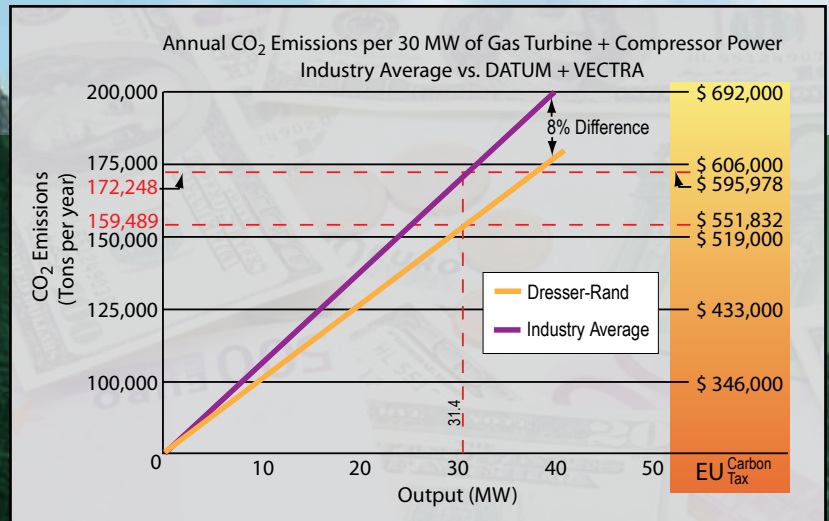
# Putting the Green Back Where it Belongs

*Developing environmental solutions with economic value.*

Many exciting opportunities lie ahead as Dresser-Rand helps its clients improve their process efficiencies, meet increasingly stringent environmental regulations and increase energy capacity worldwide...all the while remaining focused on the environment.

The economic advantage of Dresser-Rand's solutions is apparent in the adjacent charts. By providing the most efficient technology in the industry, Dresser-Rand minimizes the cost of protecting the environment.

The company is well positioned – with its leading edge technology, short cycle times, advanced business processes, and global presence – to help its clients be more competitive and meet rising demand for energy in an environmentally responsible way.

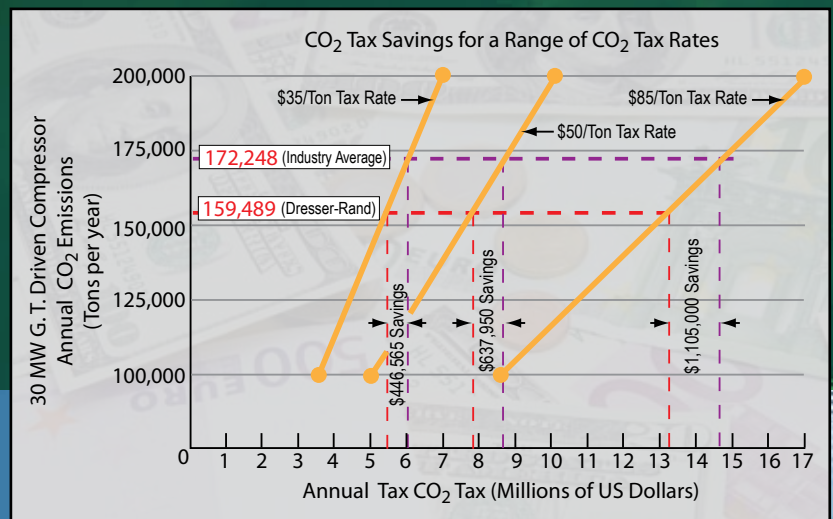


Development of CO<sub>2</sub> sequestration technology is a major step toward reducing harmful greenhouse gases. Although CO<sub>2</sub> sequestration is in its developmental stage, Dresser-Rand already produces equipment to compress CO<sub>2</sub>, transmit it through pipelines, and inject it into aquifers.

CO<sub>2</sub> sequestration involves the capture, extraction, separation, and collection of carbon dioxide gas from power plant exhaust to prevent it from entering the atmosphere. Once the carbon dioxide is captured, it is stored permanently in deep saline aquifers, injected into

older oil fields to facilitate oil recovery, or purified for use in other industrial and commercial applications.

**One VECTRA-driven DATUM compressor train saves 12,750 tons of CO<sub>2</sub> per year and more than \$600,000 per year in CO<sub>2</sub> tax.\***



\*Based on a tax rate of \$50 per ton of CO<sub>2</sub>.

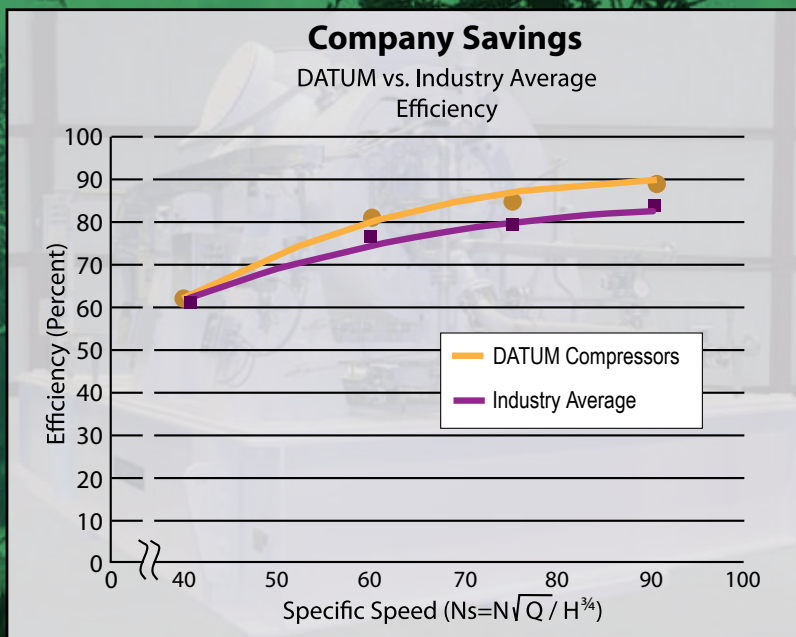
## TECHNOLOGICAL ADVANTAGES OF THE DATUM® COMPRESSOR

*Higher efficiency means lower energy costs and lower emissions.*

From our initial concept of the DATUM compressor, our goal with this product line was to produce a better centrifugal compressor – **always with an eye toward the environment.**

The superior efficiency of the DATUM compressor reduces driver fuel consumption, which can decrease harmful CO<sub>2</sub> and nitrogen oxide (NOx) emissions. Depending on application requirements and configuration, DATUM compressors often operate at efficiencies that are four to five percent greater than competitive turbomachinery. The result: reduced fuel consumption or increased throughput per installed horsepower – **and lower emissions.**

Our applied technology capabilities can provide the benefits of the latest DATUM compressor technology in nearly any make or model of installed turbomachinery to adapt it to your operating conditions and requirements. We have many unique solutions designed to improve compressor operation and performance.



## HIGHLY EFFICIENT VECTRA® POWER TURBINE TECHNOLOGY

*Designed to save time and money, and maximize availability.*

Dresser-Rand has designed gas turbine-driven centrifugal compressors and mechanical drive gas turbine packages for more than half a century. Our new VECTRA power turbine models feature a modular concept to provide maximum serviceability while reducing downtime.

Our dry low emission (DLE) solutions for the VECTRA 40G power turbine can reduce NOx emissions by approximately 80 percent. Most environmental regulations require that all continuous-duty units be low-NOx installations (the preferred method is DLE, but Dresser-Rand builds non-DLE packages with DLE retrofits in mind).

# DRESSER-RAND®

Bringing energy and the environment into harmony.\*

For a complete list of products and services, visit: [www.dresser-rand.com](http://www.dresser-rand.com) or contact the following:

## CORPORATE HEADQUARTERS

### Dresser-Rand

West8 Tower, Suite 1000  
10205 Westheimer Road  
Houston, Texas 77042  
Tel: (Int'l +1) 713-354-6100  
Fax: (Int'l +1) 713-354-6110

### Dresser-Rand

112, Avenue Kleber  
Cedex 16  
Paris 75784 France  
Tel: (Int'l +33) 156 26 71 71  
Fax: (Int'l +33) 156 26 71 72

Email: [info@dresser-rand.com](mailto:info@dresser-rand.com)

## REGIONAL HEADQUARTERS

### The Americas

West8 Tower, Suite 1000  
10205 Westheimer Road  
Houston, Texas 77042  
Tel: (Int'l +1) 713-354-6100  
Fax: (Int'l +1) 713-354-6110

### EMEA

(Europe, Middle East & Africa)  
Dresser-Rand S.A.  
31 Boulevard Winston Churchill  
Cedex 7013  
Le Havre 76080 France  
Tel: (Int'l +33) 2-35-25-5225  
Fax: (Int'l +33) 2-35-25-5366/5367

### Asia-Pacific

Dresser-Rand Asia Pacific Sdn Bhd  
Unit 9-4, 9th Floor  
Bangunan Malaysian Re  
17 Lorong Dungun  
Damansara Heights  
50490 Kuala Lumpur, Malaysia  
Tel: (Int'l +60) 3-2093-6633  
Fax: (Int'l +60) 3-2093-2622

## “CLEAN COAL” TECHNOLOGY

*Reducing the carbon footprint.*

Dresser-Rand's centrifugal and reciprocating compressors are the solution for CO<sub>2</sub> capture technologies that use coal to make a cleaner-burning fuel to produce electricity. One example — plans are underway to produce a new, clean coal plant to power the city of Jamestown, New York. The plant would serve as a 40 MW demonstration project of coal-burning technology known as oxy-coal. This technology would change the way coal is burned to reduce harmful emissions and potentially allow the CO<sub>2</sub> produced at the new facility to be captured and safely stored underground.

## NORTH SEA PROJECT

*More than 10 million tons of CO<sub>2</sub> already sequestered at Sleipner field.*

Since 1997, Norway-based Statoil has been using Dresser-Rand legacy centrifugal compressors to inject approximately one million tons of recovered CO<sub>2</sub> a year (equates to 10,000 tons per year in lower CO<sub>2</sub> emissions) into a saline formation on its Sleipner field under the North Sea. The amount being sequestered is equivalent to the annual output of a 150 MW coal-fired power plant. Today's DATUM compression technology could inject the same amount of CO<sub>2</sub> into the aquifer using 8 percent less power; this equates to 8 percent less fuel consumption required in the gas turbine driver, and 8 percent lower CO<sub>2</sub> emissions. Assuming more CO<sub>2</sub> was available to run the gas turbine drivers at rated load, the VECTRA power turbine, with its efficient, high-speed design, could provide the required power with 2 percent less fuel consumption by eliminating a speed-increasing gearbox. Therefore, this same application could be handled today with 10 percent less fuel consumption, which would eliminate more than 6,000 tons per year of CO<sub>2</sub> emissions.



**DATUM** gas reinjection compressor train driven by a Dresser-Rand VECTRA power turbine.

In addition to CO<sub>2</sub> sequestration and other carbon-related activities, Dresser-Rand is involved in several **additional emerging “green” market opportunities** — floating LNG; marine wave energy; combined heat and power; turbo-

compound systems; compressed air energy storage (CAES); and Ramgen supersonic shock wave compression.

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