Zacks Small-Cap Research

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Clean Diesel Tech. (CDTI-NASDAQ)

CDTI:
Initial Synergized-platinum group metal diesel oxidation catalyst test results show comparable activity to best in class.

Current Recommendation	**BUY**
Prior Recommendation	Neutral
Date of Last Change	02/23/2012
Current Price (05/04/15)	$1.85
Six- Month Target Price	**$4.00**

OUTLOOK

Clean Diesel Technologies is a leading provider of pollution control solutions for gasoline and diesel engines. The company offers both OEM and after-market products on a worldwide basis. The company was formed by a merger in October 2010.

Over the next several years significant on highway diesel vehicle pollution regulations will be implemented which will have a major impact on the company's revenue and earnings. Off highway markets are also significant and are becoming important to Clean Diesel.

SUMMARY DATA

52-Week High	**$3.91**
52-Week Low	**$1.44**
One-Year Return (%)	**-34**
Beta	**2.5**
Average Daily Volume (sh)	**88,593**
Shares Outstanding (mil)	**14.15**
Market Capitalization ($mil)	**$26.2**
Short Interest Ratio (days)	**12**
Institutional Ownership (%)	**4.1**
Insider Ownership (%)	**3.8**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**93.4**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/M**
P/E using 2014 Estimate	**N/M**
P/E using 2015 Estimate	**N/M**
P/Sales on L4Q Sales	**0.6**

Risk Level	**Above Average**
Type of Stock	**Small-Value**
Industry	**Pollution Cntrl**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2013	**$13.3 A**	**$12.6 A**	**$14.2 A**	**$15.2 A**	**$55.3 A**
2014	**$12.5 A**	**$12.6 A**	**$9.3 A**	**$8.7 A**	**$41.2 A**
2015	**$9.5 E**	**$10.0 E**	**$10.5 E**	**$11.0 E**	**$41.0 E**
2016	**$11.0 E**	**$12.0 E**	**$12.0 E**	**$13.0 E**	**$48.0 E**

Earnings per Share
(EPS is operating earnings before non recurring items)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2013	**-$0.29A**	**-$0.19A**	**-$0.12A**	**-$0.14A**	**-$0.82A**
2014	**-$0.16A**	**-$0.05A**	**-$0.06A**	**-$0.19A**	**-$0.76A**
2015	**-$0.22E**	**-$0.19E**	**-$0.15E**	**-$0.13E**	**-$0.68E**
2016	**-$0.11E**	**-$0.08E**	**-$0.08E**	**-$0.05E**	**-$0.32E**

Zacks Projected EPS Growth Rate - Next 3 Years % **15**

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RECENT NEWS

Clean Diesel has announced that its diesel oxidation catalyst SPGM™ achieved oxidation results as good as the leading OEM manufacturer product at 20% of the cost. Heavy duty diesel engines produce a lot of residual hydrocarbons and soot and oxidizing this to carbon dioxide (and water) takes a lot of catalyst. Reducing the cost of the catalytic convertor is a significant benefit to the truck operator.

SPGM is not based on the Spinel technology that is currently being tested. Results for this catalyst should be available this quarter.

Fourth quarter results, announced March 17, 2014 were less than expected due to lower catalyst sales and a slower ramp of DuraFit diesel systems.

	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14
HD Diesel revenue	$12.6	$11.0	$8.7	$8.4	$7.3	$7.1	$8.0	$10.2	$7.2	$7.0	$3.7	$3.5
Operating Inc *	$0.4	$0.1	$0.3	$0.1	$0.3	$0.1	$0.7	$0.7	$0.3	$0.7	$0.7	$0.1
Catalyst revenue	$6.1	$6.4	$6.7	$5.1	$6.5	$6.3	$7.2	$5.9	$5.8	$6.3	$6.2	$5.5
Gross profit*	$0.3	$0.7	$0.3	$1.1	$0.1	$0.1	$0.6	$0.2	$0.2	$0.4	$0.1	$1.4
Sales to HDD Division	$1.7	$0.7	$1.0	$1.1	$0.4	$0.9	$1.0	$0.9	$0.5	$0.7	$0.6	$0.3
External sales	$4.4	$5.7	$5.7	$4.0	$6.1	$5.4	$6.2	$5.0	$5.3	$5.6	$5.6	$5.2
All revenue	$17.0	$16.7	$14.4	$12.4	$13.3	$12.6	$14.2	$15.2	$12.5	$12.6	$9.3	$8.7
Operating income	$2.4	$1.5	$1.2	$1.8	$2.0	$1.2	$0.1	$0.0	$1.1	$0.5	$1.6	$3.1
Pro forma Net income	$2.8	$2.3	$1.8	$2.2	$2.7	$1.4	$1.1	$2.5	$1.6	$0.6	$1.6	$2.6
Gross profit was replaced by operating income in 2012.												

DuraFit did provide close to 15% of HD Diesel revenue and is expected to ramp up quarter by quarter in 2015. CDTi is close to securing, as a customer, its first major fleet operator through one of its independent distributors.

The company has made significant progress in developing a powder processing system for coating catalyst substrates. Instead of selling a coated ceramic system by selling a powder the customer can than coat its own substrate. There are many catalyst coaters world-wide that are not current customers and by providing the powder CDTi will expand its available market. The powders will all of the company's current catalysts as well as future ones that include Spinel derivatives. Since Spinel is a metallic crystalline matrix and is not soluble the use of powder deposition is an ideal method of coating the ceramic substrate.

The Spinel system is undergoing intensive accelerated testing using the same aging and drive cycle testing as used by the automobile companies. Some test results should be available mid 2015. The catalyst are being optimized for various engine types including small high performance direct fuel injected petrol engines as sold by the Japanese car companies.

In line with the potential markets using powders Clean Diesel has amended its agreement with TKK so the CDTi can sell its catalysts in Asia, including China. The company will pay a 4% royalty fee to TKK, up to a certain maximum.

The company gave early guidance for 2015 of revenue between $40 and $45 million, gross margins between 25% and 28%. This includes the start-up costs of DuraFit. As DuraFit ramps up gross margins could reach 30%. Continuation of the growth and margin improvement should lead to profitability in 2016.

The mayor of Paris has proposed a ban on most diesel engined vehicles from the city by 2020 in order to lower air pollution. Buses and trucks will be banned from the city first, followed by all diesel vehicles made before 2011. Paris is one of the largest, and most popular tourist destination, in Europe. But the introduction of Low Emission Zones (LEZ) similar to the London England LEZ is a national government responsibility and there are few such zones, unlike Germany and the BENELUX countries.

The Parisian mayors have made a number of similar proposals over the years, such as banning all old cars, and most of them have received vehement decrial from other political parties. One of the problems, not discussed by the Mayor, is that diesel cars are very popular in Europe and large trucks (all of which are diesel powered) are the predominant mode of cartage in western, central and eastern Europe.

We do not think that the proposal will fly but Paris needs a solution and a LEZ would fit the bill. This would be positive for CDTi.

CDTi has announced the launch of a new website to provide information about the benefits of the company's replacement filters together with links to video, sales literature and a product catalog. This will provide a valuable resource to expand and support CDTI's position in the rapidly growing market for the products.

Industry sources report that the market for after-treatment maintenance and repair was $500 million in 2010 and is expected to grow at 25% per year to reach $3.0 billion by 2017. The production of medium and heavy trucks had declined from 400,000 units in 2002 to 250,000 units in 2013 but is increasing to an over 330,000 annual rate by the end of 2014. The replacement market is expected to track heavy duty trucks production with a lag of about 3 years.

On Nov. 13, 2014 CDTi agreed with its principle lender, and largest stockholder, Kanis S. A. to extend the maturity dates on several notes in return for granting to Kanis S. A. warrants to purchase 80,000 shares.

The maturity dates on the 8% shareholder note of June 30, 2015 ($1.5 million), the 8% subordinated convertible note of April 11, 2016 ($3.0 million) and the 8% shareholder note of July

27, 2015 ($3.0 million) were extended to Oct. 01, 2016. In addition the early redemption feature of the convertible was removed.

The warrants have an exercise price of $1.75 for 5 years. We assume that the 80,000 shares would be registered if the warrants were exercised.

The extension of the notes and the probable cash from the warrants gives the company some breathing room and the capability of generating cash from possible royalties from the Spinel™ technology before the note become due.

The Donaldson Company [DCI] announced on Nov. 13, 2014 that it would close its Grinnell, Iowa, facility that manufacturers mufflers and exhaust products for off-road equipment. This is an affirmation of CDTi's decision the sell it Nevada facility.

The company announced its 3Q14 financials on Nov. 07, 2014, followed by a conference call at 0800 Pacific time.

Revenue was ahead of our revised estimates and of company guidance. Gross margins were essentially flat with the prior quarters whereas we had assumed some improvement. Operating loss was $1.6 million as compared to our estimated loss of $1.8 million. Net other expenses were a profit whereas we had assumed a charge to earnings so that pretax income was better than expected. There was a tax credit, probably due to domestic tax credits exceeding foreign taxes. Overall the quarter was better than we had expected. Looking into 2015 the sale of the Reno based operations should have a positive impact on margins.

CDTi is moving its diesel operations from an emphasis on the retrofit market to selling replacement systems for class 5 to class 8 trucks. The number of older trucks that do not have pollution control systems is declining rapidly and the new DuraFit products are aimed at the replacement market. This currently a 150,000 plus unit market with a value of $300,000 at the manufacturing level and $500,000 at the dealer sales level. The company has over 40 part numbers for various systems across a wide spectrum of trucks.

CDTi announced on Nov. 04, 2014 that it has sold 1.385 million common shares, series A warrants (an aggregate of 388,393 shares) and series B warrants (equal to 168,571 shares) for a total of $4.35 million gross and $3.8 million net proceeds. The sale was effective on Nov. 07, 2014. We have adjusted our numbers to reflect the increase in shares outstanding. Under accounting regulations share equivalents are not counted when a company reports a loss so the increase in shares outstanding will be 1.385 million.

On Oct. 30, 2014 CDTi announced that it the US Patent Office had granted it two patents on the company's catalyst systems that do not use Platinum Group (PGM) or rare earth metals (Lanthanides). These patents are the first to be granted of those that have been filed over the

past few years on the family of Spinel™ technology. They can be applied to both gasoline and diesel engines.

The current technology uses combinations of metals that occur in small amounts or in very few places (or both) and are expensive. The trend over time has been to reduce the concentrations of the metals or replace them by other less expensive materials. By using metals such as Magnesium and Aluminium (this is the correct International name) that form a crystalline structure known as spinel, $MgAl_2O_{4..}$ Other similar metals such as Iron and Chromium are included in the crystal matrix found in nature and give the crystal its color. The semi precious spinel jewels are often found where rubies occur. Synthetic spinels were first produced in the mid 18 century.

We have often mentioned in our reports that CDTi has applied for patents on, or is working on, catalysts that do not include PGMs or rare earth metals. The current catalyst system supplied to Honda America is one step in the evolution of low to zero PGM catalysts. The Honda catalysts are capable of meeting the Level 3 requirements of the EPA.

The new Spinel ™ catalysts are currently being tested in vehicles. This is an exhaustive process that can take a year or more before being approved by the EPA. Auto manufacturers are very conservative in applying new technology, often freezing the use of a technology for three to five years. The current Honda Accord system was introduced in 2012, and it is unlikely that it will be replaced before the 2016 model year.

In our opinion this announcement is a significant one. Low cost antipollution catalyst can be used in many industries, from power stations to ULCCs. Many countries in Asia do not use catalysts on the ubiquitous 100 cc motorcycle, leading to major pollution problems in such cities as Manila and Bangkok. Even Ho Chi Min City, the largest city in Vietnam, is beginning to suffer from smog.

The new family of catalysts could be a major source of revenue and earnings, including licenses, starting in 2015 and gathering momentum for many years.

Clean Diesel announced on October 22, 2014 the sale of its Reno, Nevada operations for $1.3 million (subject to final review) to SES (Shuttleworth Exhaust Systems), which was also a distributor for CDTi. SES was divested from CES (part of CDTi) in 2007. Included in the assets of the deal is $0.4 million of intangibles. The Nevada operation produced custom exhaust systems and parts and was not integral to the diesel pollution control business. The operations being divested generated about $2.8 million in sales with an operating margin of 7% in the first nine months of 2014.

In the 8K filing the company outlined the 3Q14 revenue and operating loss. After adjusting for the divestiture revenue is expected to be $9.3 million with an operating loss of $2.5 million, which includes $0.8 million of non reoccurring charges such as severance. We have adjusted our forecasts to include the impact of the divestiture.

On the 8 August, 2014 CDTi announced its second quarter results. Revenue was close to our estimate ($12.6 million actual versus $13.0 million estimated) and, as expected, gross margins continued to improve Y/Y and with a slight gain from 1Q14. The pretax loss of $1.1 million was what we had expected. California sales were 2.8 million. HD Diesel revenue declined slightly from 1Q14 levels to $7.0 but operating income increased by 133% from first quarter levels. Catalyst revenue was flat versus year ago levels and down slightly as compared to the first quarter. Operating income doubled from 1Q14 to $0.4 million.

Operating expenses (excluding termination expenses) were flat as compared to both the first quarter and year ago. However, there was a $0.3 million profit from the sale of a building in Sweden included in SG&A. Overall we were satisfied by the results but the company is still some way away from profitability.

CDTi launched a new initiative on Aug. 5, 2014, the DuraFit^{TM} line of replacement diesel particulate filters (DPF). This is a $550 million annual market for out of warranty DPFs fitted as original equipment when an engine and truck were first purchased. A DPF has a lifetime of about five years so this is a sustainable market for CDTi. The diesel engine classes of 5 to 8 is a current market of about 150,000 units. These DPFs will be sold through the company's current sales channels and industry source expect this market to grow substantiality over the next five years.

<u>The Changing of the Guard:</u>

Over the past year there have been an unusual number of changes at Clean Diesel, as summarized below.

In December, 2013 Craig Breese, the CEO, resigned.

The Principal Accounting Officer (who was also the Corporate Controller) gave notice on April 1, 2014 in order to accept a position at another company.

In May, 2014 Derek Gray, a Director since 1998, did not stand for reelection.

On July 7, 2014 Christopher Harris was appointed President and CEO. Mr. Harris was President of Catalytic Solutions. one of the predecessor companies.

The company announced on July 11, 2014 that the HQ would be relocated from Ventura, CA to Oxnard, CA (where its catalyst production facilities are located).

The CFO, who was also one of the two members of the Office of the President, resigned (with a generous compensation package) effective August 31, 2014 and will be succeeded by Mr. David E. Shea who was Corporate Controller at Catalytic Solutions prior to the formation of CDTI in 2010.

When companies change CEOs it is not unusual for there to be a realignment of responsibilities and changes in senior management, as well as changes in strategic directions. However, in this case the strategic plan has been, for some time, to emphasize the IP of the zero platinum group catalysts and to move away from unprofitable metal bending.

We do not expect the recent moves to have any major impact on the financials of the company in the near term.

The company's stock has been added to the Russell Microcap index. Each year Russell Investments rebalances the membership of its indices based of market capitalization as of the end of May. The membership remains in force for one year and then the indices are recast again. Investment managers use membership in the indices to form passive index funds and funds based on micro cap. investments. As such funds grow with new cash there is an inherent demand for stocks in the indices.

Diesel Emissions Reduction Act Grants (DERA 2012-2016)

In January 2010, President Obama signed legislation, H.R. 5809, reauthorizing DERA grants to eligible entities for projects that reduce emissions from existing diesel engines. The bill, passed by the Senate on December 16 and the House on December 21, authorizes up to $100 million annually for FY2012 through FY2016 and allows for new types of funding mechanisms. $29.9 million was appropriated by Congress for FY2012.

(Source: EPA web site)

R. Craig Breese has resigned his positions as CEO, President and member of the Board of Directors. Based on his employment agreement the Board of Directors has determined that his departure will be treated as termination without cause. In such cases it is usual that any stock options will not become vested or future options will not be granted. Nikhil A. Mehta CFO and Pedro J. Lopez-Baldrich, VP of Administration will act in the capacity as the Office of Chief Executive Officer.

Over the past two years the opportunities of vehicle pollution control in the London LEZ and the California CARB programs have illustrated the difficulties in sustaining a return on investment from mandated and unwanted abatement programs. In London the program was completed in a short period of time and future revenue is unlikely. CDTi did not make a profit from this program and there is no follow-on business. The CARB initiatives have been resisted by the truck and bus operators and cumulative gross profit over the last 7 quarters is a loss. Only a significant cost cutting program had reversed the quarterly losses and some of the profit is probably due to the catalyst revenue from Honda.

In our opinion, the uncertainties of government mandated pollution control initiatives do not warrant a significant investment by small companies unless they can achieve market shares exceeding 25% to 30% of the revenue in such initiatives. Also, such initiatives as large as California's are few and probably not worth waiting for if they only generate $30 to $50 million in revenue.

The profitable future of Clean Diesel is in the catalyst business. However, it needs to expand its customer base to other programs within Honda and to other automobile companies. In general automobile companies are very slow to adopt new technology even when it saves them money.

The California retrofit market has come to life. Pollution enforcement has picked up and vehicle operators are being fined. KS Industries, a Bakersfield CA construction company, was fined $230,000 for non compliance and inspections have significantly increased at the Otay Mesa US-Mexican crossing. As a result orders for retrofit equipment are increasing and revenue to CDTi is increasing. California retrofit revenue was about $3 million in the third quarter, and non-retrofit business increased slightly to 40% of HDD revenue.

We expect CARB retrofit revenue to increase significantly next year, and then decline as trucks become compliant or are sold out of state. However, the off-the-road business should grow and the new EGR systems should be a significant contributor.

Catalyst sales increased significantly Y/Y, up 39% after adjustment for the metal pricing changes made last year. Honda continues to be the driver of this business.

E Cube, the JV with Pirelli, has been dissolved. The poor business climate in Europe had made it impossible to meet the sales targets and a further review of CDTi's objectives suggested that E-Cube was not the best fit with the strategic plan. The loss from E-Cube was $0.4 million and this was about the same as what CDTi would have lost in Europe without the joint venture.

Honda uses a four to five year lifetime for model platforms. Although automobile manufacturers can change suppliers as they please any change in pollution control systems would require recertification of the platform. Consequently CDTi has a strong position on the Honda Accord for the next four years.

The public offering, with Roth Capital Partners, LLC as sole manager, consists of 1.6 million shares priced at $1.245 and warrants to purchase 0.8 million shares with an exercise price of $1.25. The warrants are immediately exercisable for a period of five years. The underwriters have a 30 day option to acquire 240,000 shares and 120,000 warrants. CDTi has also agreed to

convert $0.235 million in principle and interest to common stock and to sell $100,000 of common stock to a director, Dr. Lon Bell, in a private placement.

The company has completed the strategic review of its businesses and has decided to "pursue aggressive development of its unique materials science platform". Clean Diesel is a leader in zero platinum group metal (ZPGM) catalyst systems but has no competitive edge in metal bending.

The skill in making catalyst systems is how to deposit the catalyst on a substrate, which may be silica or silicon carbide (of which there are many suppliers). Clean Diesel has patented its processes and the composition of the catalysts. As such they are a leader in the market.

Clean Diesel Inc. has changed its name to **CDTi** although its legal name remains Clean Diesel Inc.

Both Honda and Clean Diesel have announced that Clean Diesel will supply a new palladium only catalyst system (invented by CDTi), first for the 2013 model Accord currently being built in North America, and then to other Honda models. The new system will reduce precious metal content by 22% and Rhodium content by 50%. This cuts the cost of the system by 37% while complying with some of the most stringent emission regulations in the world. This business will have a significant impact on Clean Diesel's revenue and profit. Over the past two years the company has been impacted by the problems in Japan that had an effect on parts availability. This catalyst will be used in other Honda cars, presumably Accords being built in other countries, on a sequential basis. In August 2012 Honda sales increased by 59.5% to 131,321 vehicles, the Accord increasing by 89%. The seasonally adjusted sales rate was 14.52 million vehicles as compared to 12.8 million vehicles in 2011.

Clean Diesel Technologies and American Infrastructure Leasing (AIL) have partnered to supply equipment leases on Clean Diesel's ECS-branded diesel particulate filters (DPF) to vehicle and fleet owners in North America. American Infrastructure Leasing has a strong franchise in providing capital to the vehicle and fleet owners. Using capital from AIL truckers can acquire DPF equipment on attractive terms.

On May 31, 2012 Clean Diesel announced that the company had received an expanded verification from the EPA for its ECS-branded Purifilter Plus emission reduction system. This is the only DPF hybrid system that employs both passive and active regeneration that the EPA has verified for use in engine retrofit programs. That the system is EPA approved expands the market to include all states that accept EPA verification without having more stringent individual approval programs (relatively few states have programs similar to CARB). The verification includes retrofitting to both exhaust gas recirculation (EGR) and non-EGR diesel engines built from 1994 to 2010 for on-road use. This includes all types of diesel trucks and increases the total available market for the company's systems.

KEY POINTS

- Pollution impacts life expectations.
- Pollution control is driven by regulation on a national, regional and city basis.
- Gasoline engine emission control is a mature market in the U.S., Europe and Japan.
- For CDTI the auto market is an OEM market but the diesel market is an after-market business.
- Other countries like China and India are starting pollution abatement initiatives.
- The higher the standards the more advanced is the technology (at a higher cost) and this is a barrier to entry for small companies .
- Changing emission standards over the next five years will drive revenue and earnings significantly higher.

OVERVIEW

There are many ways to convert a fuel to power that can be used to produce motion. These include engines that run on gasoline, diesel and bio-diesel, kerosene, steam, electricity, propane (and butane) and compressed natural gas. There are many engine types including internal combustion engines such as two stroke, four stroke, diesel, Wankel rotary, jet engines as well as external combustion engines such as the Stirling cycle engine and steam generators where the fuel is burnt to produce heat in a secondary fluid which then drives a turbine to produce electricity.

The problem with all engines based on burning a fuel is that a product of combustion is pollution. This is usually a combination of un-burnt fuel (usually hydrocarbons, HC), carbon monoxide (poisonous, CO) and various oxides of nitrogen (that produce brown smog, NOx). Certain fuels also produce particles of soot (carbon) produced by incomplete combustion of the fuel. Burning coal (or wood) to produce steam that drives a turbine that produces electricity also produces ash that has to be removed from the exhaust gas.

Pollution poses health hazards. The EPA estimates that diesel pollution is the cause of 12,000 premature deaths; 280,000 child respiratory cases and 200,000 child asthma cases (although there may be some double counting here) and a loss of 1,000,000 workdays. California air pollution costs are estimated to be as high as $130 billion. According to the WHO particulate matter (PM) reduces life expectancy by 8.6 months for every person in the European Union (EU) and that the EU could save up to $225 billion a year by reducing air-pollution related deaths.

Despite all of the estimated benefits of controlling air pollution the business is driven by government regulation. This is because pollution control is an expense that is not offset by significant improvements in productivity and is an expense that is a capital and operating cost to the operator.

The US imposed automobile exhaust control starting with the 1975 model year (production starting in mid 1974). General Motors decided to use a catalytic converter developed by the Engelhard Corporation for use on forklifts in warehouses and this forced all the other auto companies to use the same technology. The early catalysts used relatively large amounts of platinum and so they were expensive. Over the years the driver has been to reduce the cost by using other platinum group metals as well as non-precious metals. The first catalyst were 2-way catalyst that converted HC and CO into carbon dioxide and water. Later developments resulted in 3-way catalysts and engine modifications that reduced the emission of NOx.

This was followed by diesel engine emission controls. A diesel engine is a compression ignition engine. There is no spark plug. Compressing the air/fuel mixture in the first upstroke causes it to heat up and explode so diesel engines are more robust than gasoline engines. The cylinder temperatures are much higher in diesel engines and this causes more NOx to be formed. Diesel exhaust also contains more oxygen than gasoline engine exhaust. Too much oxygen is a problem for 3-way catalysts so they cannot be used on a diesel engine. However, 2-way catalysts work well and are used to control HC and CO. The energy during combustion also converts some HC to carbon and this soot (PM) has to be removed.

Regulations have been imposed on stationary power sources such as engines used in mining (drag lines for example), construction equipment, railway engines and off-road vehicles and ships.

Other countries impose pollution control. Although often criticized, China has an active vehicle pollution control program (based on European standards) that started in 2010 and may be upgraded in 2012.

Pollution control is driven by legislation

Market/Application	2010	2011	2012	2013	2014
U.S. on-highway	EPA10		TRB[1]	TRB[1]	TRB[1], CA LEV III
U.S. off-highway	Tier 3/4	Tier 3/4	Tier 4	Tier 4	Tier 4
Europe off-highway		Stage IIIA/IIIB	Stage IIIA/IIIB	Stage IIIB	Stage IV
Europe on-highway	Euro V	Euro V		Euro V/VI	Euro VI
Brazil on-highway	Proconve China has an active P5[2] (Euro III)	Proconve P5[2] (Euro III)	Proconve P7 (Euro V)	Proconve L6	Proconve L6
China on-highway		Euro IV	Euro IV/V (proposed)	Euro IV/V	Euro V
India on-highway (major cities)	Euro III/IV[3]				

Source: Clean Diesel Technologies, Inc.

[1] California Air Resources Board Truck and Bus Regulation
[2] Proconve P6 standards were not implemented; P5 standards remained in effect through 2011
[3] Euro IV standards are implemented in National Capital Region (NCR) and 11 noncompliant cities

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Source: www.dieselnet.com/stndards

ARB Estimate[1] of Class 7 & 8 HD Trucks in California with Mandatory Retrofit Requirement from 2012 thru 2014[2]

Model Years	Class 8 (>33,000lbs)	Class 7 (26,000-33,000lbs)	Total
2003 – 2006	53,404	9,625	63,029
1998 – 2002	36,488	11,527	48,015
1997 and older	37,470	22,317	59,787
Total Number of Trucks			170,831

Note:
- Only includes California-based trucks
- Trucks outside California meeting certain criteria must also comply with retrofit requirements
- Does not include school buses which also must comply with retrofit requirements
- Assumes trucks remain in use

CDT management estimates that CDT CARB verified products can address the emission requirements of over 70% of the vehicles estimated above.

[1]Analysis based upon draft vehicle population estimate provided by Mobile Source Analysis Branch of ARB. Numbers are based upon an extrapolation of 2005 DMV registration data and reflect an approximate estimate only.
[2]CARB Truck and Bus Regulation requires compliance of 90% of vehicles with diesel particulate filters by 2014**.**

Company Background

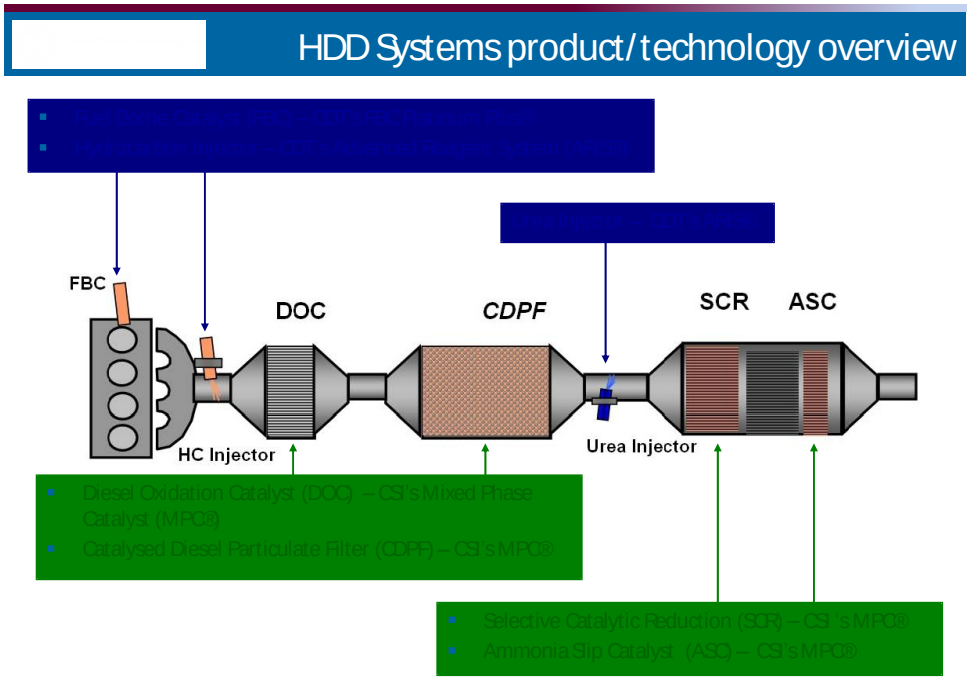
The company is organized into two divisions. The Heavy Duty Diesel Systems division is a leader and manufacturer of verified exhaust emissions control systems for the retrofit and OEM markets though a distribution and dealer network that includes PAACAR and International, two of the largest heavy truck manufacturers in the US. The Engine Control Systems (“ECS”) and Clean Diesel Technologies-branded products, such as Purifilter ® , Purifier and ARIS ® and exhaust gas recirculation with selective catalytic reduction are used to reduce exhaust emissions created by on-road, off-road and stationary diesel and alternative fuel engines including propane and natural gas. The company also promotes the Platinum Plus ® range of fuel-borne catalyst solutions into global markets.

Auto catalyst technology is being driven by lower prices and, therefore, lower costs. Platinum group metals are very expensive, volatile in price and most of the mining is outside of the largest markets with many mines in areas of political instability. The key to success is to replace the precious metals with base metals of a significantly lower price. Since the 2-way auto catalyst technology can be used in diesel applications the cost benefits can differentiate Clean Diesel from its competitors in both markets. The company is in the process of having its catalyst technology verified to be used in systems for diesel vehicles. This will allow the Catalyst division to be a supplier to the Diesel division thus improving profit margins. The ability to use its own catalyst will enable Clean Diesel to design its own systems, customizing the pollution control equipment and this will have a significant positive impact on profits.

The Catalyst division includes the company's proprietary MPC ® technology. This technology enables Clean Diesel to produce catalyst formulations for gasoline, diesel and natural gas induced emissions that offer superior performance, proven durability and cost effectiveness for multiple markets and a wide range of applications. The company has developed a family of unique high performance catalysts using base-metals or low platinum group metal and zero-platinum group metal content to provide increased catalytic performance and value for technology-driven automotive industry customers and for the Heavy Duty Diesel Systems division.

The Diesel division offers a wide range of technology, some of which are not currently approved for use in the US. The range of products and technology is shown below. Applications include on-road (the largest market); off-road (second largest market); stationary units, propane and natural gas fueled engines (both on and off road application) and clean fuels such as bio-diesel. Not only do the exhaust emissions have to be controlled but other combustion related problems, such as crankcase ventilation gases have to be enclosed and treated. Clean Diesel has a system, its ECS ventilation system that eliminates 100% of crankcase emissions which has a major impact on cabin air quality. These systems are EPA approved.

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INDUSTRY OUTLOOK

INDUSTRY OUTLOOK - POSITIVE

Both legislative initiatives and economic growth have positive impacts on the demand for, and use of, both on road and off road vehicles and machinery over the next three to four years.

For Clean Diesel the automobile (light vehicle) catalyst market is an OEM market. The systems take one to two years to develop and receive certification and are frequently designed for a particular model of automobile. Once designed in and approved the automobile company usually keeps that configuration and supplier for the life of that model. Auto production in N. America, W. Europe and Japan of gasoline engines is a flat to declining business as diesel engines penetrate the market. In several EU countries diesel engines have achieved more than a 50% penetration of new car sales. Although market penetration of diesel cars is low in the US the high price of gasoline is a strong incentive for adoption of diesel technology now that the EPA has approved the current pollution control technology used in Europe and low sulfur/low phosphorous diesel fuel is now available in the US. Sulfur poisons precious metal catalysts. The removal of phosphorous is also beneficial as it prevents an ash problem in the exhaust. Volkswagen, Mercedes, Audi and BMW offer diesel alternatives to their gasoline engines. The VW Jetta is selling well, for the first five months of 2011 sales are up nearly 70% year over year, and 50% are diesels, and dealer inventory of this model is very low.

The heavy truck market is an after-market business. Class 7 & 8 trucks, those over 26,000 lbs, have a long life. The engines can run over 50,000 miles before needing a major overhaul. As a result there are many trucks older than 10 years. As an example 35% of the HD trucks in California are over 14 years old. This is a significant and growing market for retrofit pollution control equipment. The cost to the

operator for a total system for a class 8 truck driven in California can exceed $10,000 per vehicle. The total available market for diesel retrofits in California alone could exceed $1.15 billion over the period 2012 through 2014. However, many old trucks are likely to be scrapped, some may be re-engined and some replaced by new equipment. The EPA has estimated that 20 million vehicles with diesel engines do not meet the new emission standards. Although the standards for California are the most stringent in the US, and require the most expensive retrofit equipment, other states have matched them. Using an equipment price well below the mid-point of the cost range the market for heavy duty vehicle diesel retrofits in N. America could exceed $150 billion over the next ten years. And Europe has even more stringent requirements that will require a higher level of technology. And higher levels of technology mean higher costs.

Johnson Matthey, the world's largest producer of platinum group metals has estimated that the world-wide market for exhaust catalyst systems could exceed $2.5 billion in 2016.

The 10 largest manufacturers of trucks over 16 tons GVW produced 2.16 million trucks in 2009, with Daimler AG and the Volvo Group having over 40% of the market. Daimler estimates that the medium and heavy duty vehicle market will grow from 2.1 million units in 2010 to 2.6 million units in 2013. The eight million trucks sold over this period will face tighter emission standards in 2017 and beyond, as will many other HDD trucks produced before 2010. In most cases these statistics do not include buses. By the end of 2013 the US, Europe, China, India and Brazil will face new, more stringent, standards for NOX and particulate emissions to take effect in 2014. There are 13 countries plus California, Beijing, Indian cities and S. Korea (gasoline engines) that will require new emission equipment by the end of 2015.

As well as on-road vehicles there are other sources of emissions including locomotives, ships, off-road vehicles and mining and construction vehicles, both movable and stationary.

INDUSTRY POSITION

The emission retrofit market is highly fragmented. Although Clean Diesel Technology is probably one of the top three world wide providers of vehicle emission technology and products there are many small companies and divisions of larger companies that compete in some sectors.

VALUATION

During the London UK LEZ implementation that started in 2008 the company believes it captured 15% of the available business. We consider that a market share of 15% (mainly diesel PM and NOx control) may be realistic for the for the California CARB retrofit market. Other major cities are expected to impose low pollution restrictions. The strategic shift to new and replacement diesel controls systems as well as the introduction of new technology are expected to add value to the share valuation.

Using on a price/sales ratio of 1.0 the current median value of the peer group) and 2015 revenue of $41 million results in a stock value of close to $4 a share using the share count of 14 million.

COMPARISON TABLE*	Ticker	Price	Mkt	P/E	P/E	ROE	P/B	P/S	EV/Rev.	EV/EBITDA	PEG	Inst.
(Source: Yahoo Finance)		3/20/15	Cap	L4Q	NFY	(%)	LQ	L4Q	L4Q	L4Q		Ownership
			(in million)									%
Clean Diesel Technologies Inc.	**CDTI**	**$1.91**	**$27.0**	**NM**	**NM**	**NM**	**3.87**	**0.63**	**0.70**	**0.37**	**-0.14**	**4.1**
ADA-ES , Inc.	**ADES**	$15.85	$350	N/A	30.17	7.26	N/A	N/A	1.27	N/A	N/A	53.4
Cummings Inc.	**CMI**	$138.40	$25,060	15.34	12.30	21.75	3.21	1.30	1.26	9.66	0.97	83.4
Donaldson Company Inc.	**DCI**	$38.11	$5,200	22.21	19.35	25.25	6.28	2.08	2.21	13.26	2.50	77.5
Fuel Systems Solutions Inc.	**FSYS**	$10.98	$212	N/A	N/M	N/A	0.91	0.62	0.35	12.86	N/A	43.7
Johnson Matthey Plc.~	**JMAT.L/JMPLF**	$49.10	$11,930	20.0	N/A	22.40	4.25	0.68	0.79	13.1	1.56	N/A
LiqTech International Inc.	**LIQT**	$0.81	$32	N/A	N/A	N/M	1.08	2.02	1.63	N/M	N/A	6.0
MFRI Inc.	**MFRI**	$6.13	$45	15.14	N/A	5.64	0.55	0.21	0.29	5.60	N/A	49.8
Westport Innovations Inc.	**WPRT**	$4.15	$266	NM	NM	NM	1.56	2.02	1.90	NM	NM	53.5
* Data: Zacks Investment Research and Yahoo! Financial. ~ in USD												
Mean				18.17	20.61	16.46	2.71	1.19	1.16	9.15	1.22	
Median				17.66	19.35	21.75	2.39	0.99	1.26	11.26	1.27	

RISKS

The company has a number of significant financial risks.

- It will need additional funding to cover near term losses. The company does not have positive cash flow from operations and will need to reduce costs and grow revenue to achieve profitability.
- The auditor's report for year-end December 2010 includes a "going concern" caution.
- The company has been dependent on a few major customers and the loss of one of these customers would have a significant impact on profitability.

INSIDER TRADING AND OWNERSHIP

Directors and Officers and 5% owners own 16% of the outstanding stock. As of the last report there are no institutional or mutual funds that own more than 2% of the outstanding stock.

Recent insider sales are all exercised option related.

There were no direct insider buys.

PROJECTED INCOME STATEMENT & BALANCE SHEET

Clean Diesel Technologies																		
Consolidated Statements of Operations																		
(Dollars in millions except per share data)																		
Fiscal Year Dec. 31.	2012A	1Q13	2Q13	3Q13	4Q13	2013A	1Q14	2Q14	3Q14	4Q14	2014A	1Q15 Est.	2Q15	3Q15 Est.	4Q15 Est.	2015 E Est.	2016 E	2017 E
Revenue	**$60.54**	**$13.31**	**$12.56**	**$14.21**	**$15.22**	**$55.28**	**$12.46**	**$12.59**	**$9.31**	**$8.70**	**$41.23**	**$9.50**	**$10.00**	**$10.50**	**$11.00**	**$41.00**	**$48.00**	**$52.30**
% Change	(1.71)	(21.72)	(24.93)	(1.35)	22.58	(8.68)	(6.35)	0.29	(34.45)	(42.83)	(22.10)	(23.77)	(20.58)	12.77	26.44	(4.79)	17.07	8.96
Cost Goods	45.82	10.20	9.30	9.93	10.46	39.88	8.60	8.63	6.39	6.70	0.00	7.22	7.40	7.35	7.59	29.56	33.45	34.52
G & A	14.95	3.84	3.42	2.95	3.51	13.73	3.67	3.02	2.69	3.20	12.37	3.10	3.10	3.00	3.00	12.20	12.10	12.90
In process R&D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R&D	6.72	1.27	0.95	1.20	1.29	4.70	1.29	1.48	1.83	1.90	6.54	1.80	1.80	1.80	1.80	7.20	5.28	5.02
Depr. & Amort.	0.00	0.00	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Op Income GAAP	(6.95)	(1.99)	(1.17)	0.13	(0.04)	(3.08)	(1.10)	(0.54)	(1.60)	(3.10)	(6.46)	(2.62)	(2.30)	(1.65)	(1.39)	(7.96)	(2.83)	(0.13)
Interest Expenses	1.48	0.34	0.34	0.38	0.35	1.40	0.31	0.29	0.31	0.28	1.18	0.10	0.10	0.10	0.10	0.40	0.40	2.40
Interest Income	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non Op Income	(0.76)	(0.59)	(0.15)	(0.70)	(1.17)	(2.61)	(0.05)	(0.30)	(0.81)	0.70	(1.17)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	(0.89)	0.31	0.00	0.00	0.00	0.31	(2.11)	(0.02)	1.20	0.00	(0.17)	(0.30)	(0.30)	(0.30)	(0.30)	(1.20)	(1.20)	0.00
Calc.Pretax	(10.06)	(2.62)	(1.65)	(0.96)	(1.56)	(6.78)	(3.57)	(1.15)	(1.51)	(2.68)	(8.98)	(3.02)	(2.70)	(2.05)	(1.79)	(9.56)	(4.43)	(2.53)
Taxes	(0.37)	0.11	(0.28)	0.12	0.40	0.35	0.24	0.03	(0.12)	(0.10)	0.14	0.00	0.00	0.00	0.00	0.00	0.00	(0.63)
Tax Rate	3.65	(4.36)	16.97	(12.63)	(25.53)	(5.19)	(6.64)	(2.62)	7.76	3.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00
Other Income	0.00	0.00	0.00	0.00	0.59	0.59	0.00	0.00	0.00	0.00	(1.83)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pro-forma adj.	0.00	0.59	0.00	0.00	1.20	0.88	2.25	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Income	(9.69)	(2.73)	(1.37)	(1.08)	(1.37)	(6.55)	(3.81)	(1.18)	(1.39)	(2.58)	(11.17)	(3.02)	(2.70)	(2.05)	(1.79)	(9.56)	(4.43)	(1.90)
Costs and expenses are on a pro-forma basis																		
Net For Common	(9.09)	(2.73)	(1.37)	(1.08)	(2.50)	(7.68)	(3.84)	(0.61)	(1.57)	(2.58)	0.00	(3.02)	(2.70)	(2.05)	(1.79)	(9.56)	(4.43)	(1.90)
Shares Used, millions	7.23	7.26	7.31	9.25	9.29	8.29	9.76	12.30	12.41	13.30	12.01	14.00	14.00	14.00	14.00	14.00	14.00	14.00
Earnings Per Share																		
EPS	**($1.26)**	**($0.38)**	**($0.19)**	**($0.12)**	**($0.27)**	**($0.93)**	**($0.39)**	**($0.05)**	**($0.13)**	**($0.19)**	**($0.78)**	**($0.22)**	**($0.19)**	**($0.15)**	**($0.13)**	**($0.68)**	**($0.32)**	**($0.14)**
Pro Forma EPS	**($1.26)**	**($0.29)**	**($0.19)**	**($0.12)**	**($0.14)**	**($0.82)**	**($0.16)**	**($0.05)**	**($0.06)**	**($0.19)**	**($0.76)**	**($0.22)**	**($0.19)**	**($0.15)**	**($0.13)**	**($0.68)**	**($0.32)**	**($0.14)**
Gross margins	24.32%	23.39%	25.89%	30.13%	31.29%	27.86%	31.01%	31.47%	31.38%	22.99%	100.00%	24.00%	26.00%	30.00%	31.00%	27.90%	30.31%	34.00%

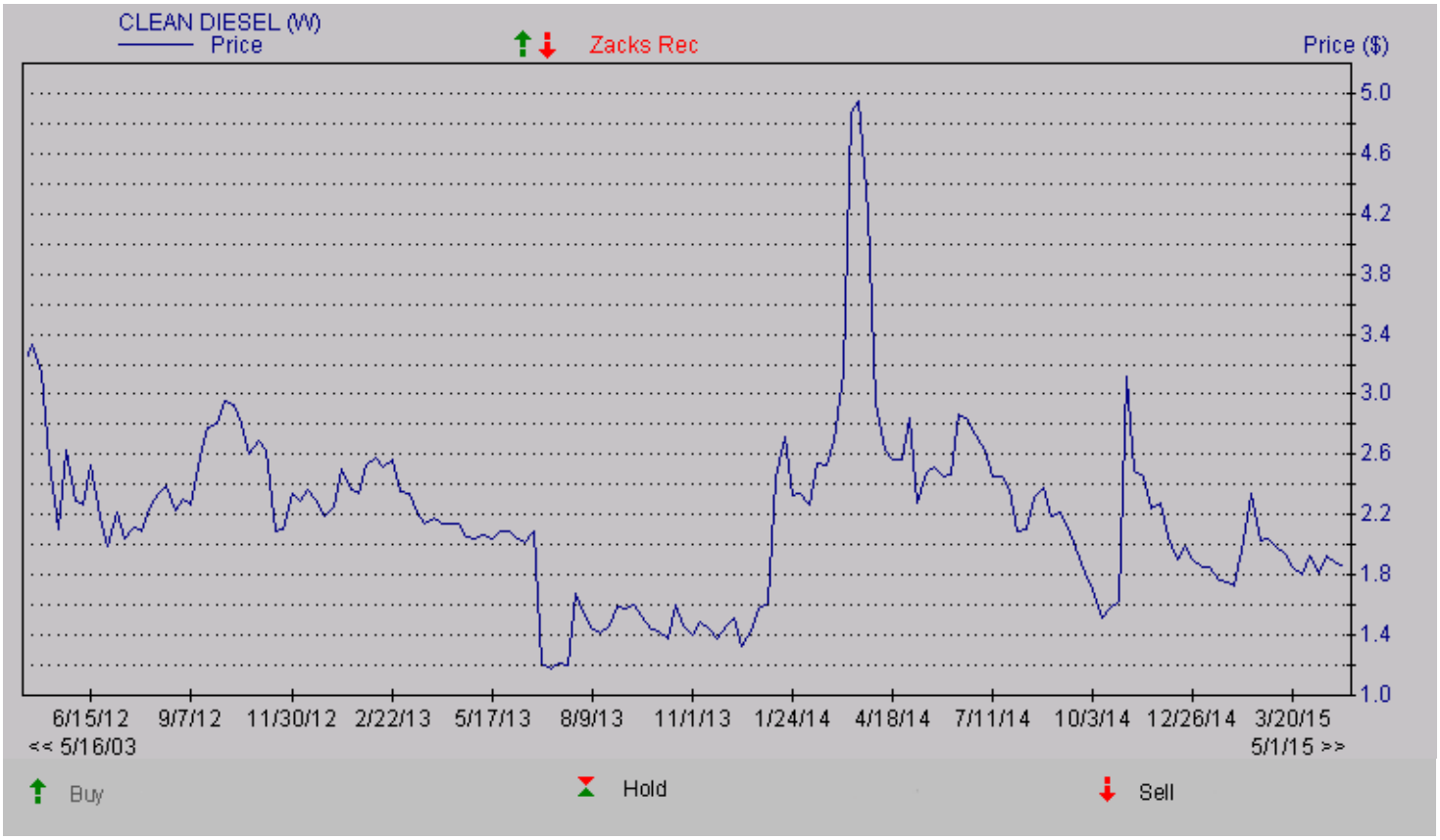
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Clean Diesel Technologies															
Consolidated Balance Sheet (in millions)															
Fiscal Year Dec. 31.															
	2010	4Q11	1Q12	2Q12	3Q12	4Q12	1Q13	2Q13	3Q13	4Q13	1Q14	2Q14	3Q14	4Q14
ASSETS														
Cash & Equiv.	5.01	3.47	4.39	3.43	7.65	6.88	4.58	3.16	4.56	3.91	3.60	8.56	4.86	7.22
A/R	5.48	11.70	8.60	8.36	7.09	5.47	6.35	5.40	7.38	5.52	6.07	5.79	3.94	2.88
Inventories	5.25	10.29	10.57	8.41	8.16	8.70	8.87	7.39	6.50	5.92	6.03	6.68	7.55	6.30
	1.82	1.66	2.23	1.96	1.63	1.76	1.46	1.53	1.57	1.46	1.43	1.86	2.99	2.13
Total current assets	17.55	27.12	25.79	22.16	24.53	22.80	21.27	17.48	20.01	16.81	17.12	22.88	19.33	18.52
Gross Plant	2.88	2.65	2.56	2.41	2.27	2.00	1.90	1.73	1.63	1.46	1.40	1.42	1.37	1.36
Deprn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Intangibles	11.97	10.95	10.97	10.56	10.71	10.46	10.15	9.76	9.75	9.38	9.04	9.02	8.24	7.84
Other	0.25	0.39	0.42	0.42	0.41	0.18	0.29	0.41	0.30	0.72	1.01	0.63	1.03	0.62
All Assets	32.65	41.12	39.74	35.53	37.93	35.44	33.60	29.38	31.69	28.37	28.57	33.95	29.97	28.34
LIABILITIES AND NET WORTH														
Debt Due 1 Yr	4.01	4.53	4.27	5.36	5.09	5.48	5.14	4.69	4.45	2.26	2.68	5.04	12.98	2.84
Notes Payable	0.00	0.00	0.00	4.58	4.61	0.10	3.10	3.10	3.00	0.00	0.00	0.00	0.00	0.00
A/P	4.59	5.95	6.67	4.73	5.29	5.61	6.81	4.87	5.25	5.37	6.04	6.39	5.07	3.02
Taxes	0.46	0.27	0.02	0.03	0.03	0.02	0.05	0.06	0.54	1.06	1.41	0.58	0.54	1.46
Other	5.70	5.02	5.61	4.96	4.79	4.51	4.34	4.11	4.91	6.00	5.43	5.69	0.50	6.19
Total current liabilities	14.75	15.77	16.58	19.65	19.80	15.72	19.44	16.83	18.15	14.69	15.57	17.69	19.10	13.51
Conv. Debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L.T.Debt	1.41	4.52	4.55	0.00	2.93	7.48	4.50	4.52	4.53	7.55	7.57	5.98	3.00	7.48
Other LT	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Def. Taxes & ITC	1.10	0.96	0.97	0.94	0.98	0.80	0.79	0.85	0.87	0.69	0.67	0.68	0.65	0.36
Other	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
All Liabilities	17.31	21.25	22.11	20.59	23.72	24.00	24.72	22.20	23.56	22.92	23.80	24.35	22.75	21.35
Pref.Stock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Common Stock	0.00	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.09	0.09	0.10	0.12	0.12	0.14
Surplus	0.00	185.47	185.56	185.70	185.91	186.11	186.27	186.44	187.85	188.11	191.70	197.11	197.33	200.77
Retained Earnings	0.00	-164.96	-167.78	-170.05	-171.82	-174.62	-176.76	-178.13	-179.22	-181.72	-185.56	-186.74	-188.31	-191.06
Other	0.00	-0.72	-0.21	-0.79	0.04	-0.11	-0.71	-1.20	-0.59	-1.04	-1.47	-0.89	-1.93	-2.87
Treasury Stock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Worth	15.34	19.87	17.63	14.94	14.21	11.45	8.88	7.18	8.13	5.45	4.77	9.60	7.21	6.99
Total liabilities & stockholders' equity	32.65	41.12	39.74	35.53	37.93	35.44	33.60	29.38	31.69	28.37	28.57	33.95	29.97	28.34

Clean Diesel Technologies							
Condensed Consolidated Statements of Cash Flows							
Fiscal Year Dec. 31.							
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Cash flow from operations:							
Net (Loss) Income	(20.80)	0.50	(8.38)	(7.31)	(9.66)	(7.10)	(9.34)
Depreciation & amortization	1.00	1.00	1.29	1.75	1.43	1.29	1.01
Amortization of goodwill & other assets	6.50	6.50	1.53		0.24		
Stock issued for services							
Stock based compensation	15.00	15.00	0.28	1.50	0.53	0.67	0.64
Impairment of machinery						0.54	
In-process R&D							
Other	5.00	5.00	1.02	(10.56)	7.30	4.18	(2.24)
Net cash provided by (used in) operating activites	**6.70**	**28.00**	**(4.26)**	**(14.62)**	**(0.16)**	**(0.42)**	**(9.93)**
Cash flow from investments:							
Purchase of PP&E	2.00	2.00	0.42	0.62	0.24	(0.14)	(0.45)
Proceeds from disposal of PP&E			2.00		0.02		1.33
Other			2.66	(0.09)		(0.71)	0.39
Net cash provided by (used in) investing activities	**2.00**	**2.00**	**5.08**	**0.53**	**0.25**	**(0.85)**	**1.26**
Cash flow from financing activities:							
Proceeds from issuance of common stock & warrants				13.18		1.84	11.45
Proceeds (payment) on lines of credit, net				1.99	0.56	(3.22)	(0.58)
Proceeds from debt - related parties					3.00		
Proceeds fromo debt							
Payment on debt - related parties					(0.08)		
Payment on debt			(0.14)	(1.24)	0.95		
Other			1.99	(1.38)	(0.61)	(2.00)	1.15
Net cash provided by (used in) financing activities	**0.00**	**0.00**	**1.85**	**12.55**	**3.82**	**(3.38)**	**12.01**
Increase (decrease) in cash and equivalents	8.70	30.00	2.67	(1.54)	3.41	(2.96)	3.31
Cash & equivalents at beginning of period			2.34	5.01	3.47	6.87	3.91
Cash & equivalents at end of period		2.34	5.01	3.47	6.87	3.91	7.22

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HISTORICAL ZACKS RECOMMENDATIONS



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