

# Clean Energy Promotion By An Agricultural Machinery Company - A Case Study Of New Holland India

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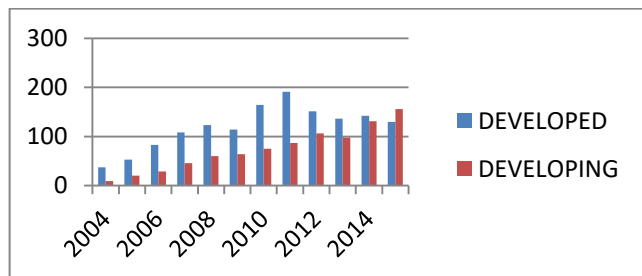
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**Abstract:** Agricultural implements industries are highly energy intensive. these industries use fossil fuel as an energy source and release greenhouse gases. there is a need to use clean energy resources in agriculture implements for the preservation of our environment and natural resources. the single industry chosen for this case study in india is the “new holland agriculture”, and is known as cnh industrial (india) private limited. the new holland has produced agriculture machinery by the brand name cnh (case new holland) industry worldwide. this industry manufactures agriculture implements such as combines, tractors, balers, forage harvesters, self-propellant sprayers, haying tools, seeding equipment, hobby tractors etc., the company has worked on clean energy strategies by using renewable energy resources in the manufacturing. the adopted clean energy practises are for preventing greenhouses gases release. this paper presents a framework of clean energy technology for sustainable development with an input-output framework.

**Keywords:** Clean Energy, Green House Gases, Agriculture Implements, New Holland, Sustainable Development

## 1. INTRODUCTION

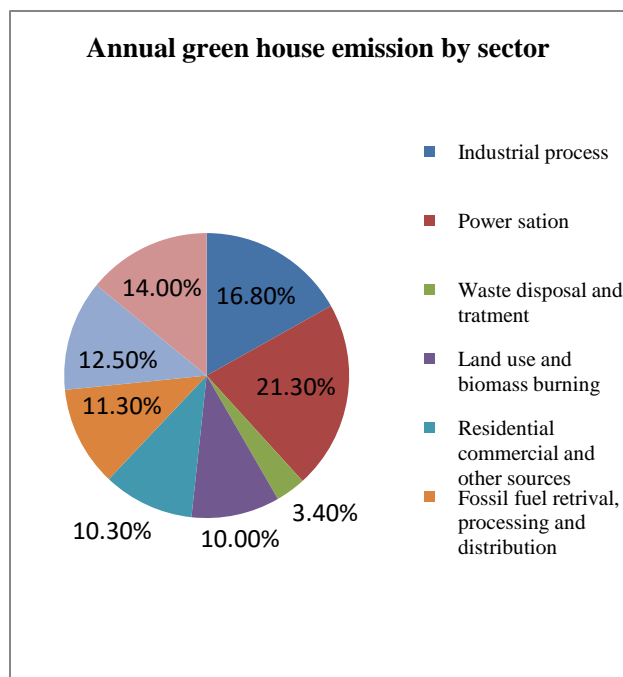
After “green revolution” farmers are pressurized to growing more and more yield of crops by using more fertilizers and agricultural machines. For meeting ever increasing demand for fertilizers and agricultural equipment more agricultural industries were established leading to more pollution and waste. Directly or indirectly they contribute to and increae the concentration of greenhouse gases. Since 1971 total energy emission has grown by 65%, which were 9.9Gt Co<sub>2</sub> in 2004 (Worrell E et al., 2009). With threat of global warming there is a need to minimize the emission of greenhouse gases and efficient utilization of renewable resources to promote renewable energy usage path to be promoted at the global level (Lafforgue G et al., 2008).



**Figure 1.** Globally increasing investment of developed V/S developing countries 2004-2015 in renewable energy  
**Source:** UNEP, Bloomberg New Energy Finance

Figure 1 represents how developing countries compute the developed countries by using of renewable energy. All sectors are come forward to use renewable energy as a source of energy in their day-to-day life to reduce the

dependency on fossil fuel, which is major source of carbon products in an environment.



**Figure 2.** Represents' different sectors participate in green house emission gases.

**Source:** Causes and effects of global warming, 2011. Indian Journal of Science and Technology, Vol. 4 issue 3 (March 2011), ISSN: 0974- 6846,226.

We have studied New Holland (CNH Industrial India Private Limited.), as an example of a Multinational

Company (MNC) operating globally, implementing clean energy practices and environmentally friendly techniques. The New Holland has produced agriculture machinery by the brand name CNH (Case New Holland) industry worldwide. This industry manufactures agriculture implements such as Combines, Tractors, Balers, Forage harvesters, Self-propellant sprayers, Haying tools, Seeding equipment, Hobby tractors etc.

## **2. CASE NEW HOLLAND**

The New Holland was initially established in Pennsylvania by Abe Zimmermann in 1895 ([https://en.wikipedia.org/wiki/New\\_Holland\\_Agriculture](https://en.wikipedia.org/wiki/New_Holland_Agriculture)). In 1999, New Holland became a brand of Case New Holland (CNH) globally. After the establishment of New Holland agriculture industries, it provided the technology and equipment for modern farming. CNH is committed to farmers and provide products and services to resolve every problem related to farming. The company used new technology in their manufacturing plant to produce new environmental friendly implements. They are also promoting the sustainability-oriented model for industries, which help run sustainable agricultural programs to solve environmental and natural resources related issues. Globally, they provide their services in 170 countries by having 64,000 employees in 64 manufacturing plant and 50 research and development centers having 12 brands across the world ([www.newhollandindia.com](http://www.newhollandindia.com)). In India, its operation was rationalized by naming of New Holland India in 1998. 70 HP tractor is the first tractor launched in Indian Market after that 3,00,000 tractor with numerous application services provides across in the world ([www.newholland.com](http://www.newholland.com)).

After 2006, CNH has come forward to become a clean energy leader by rapid promotion and development to make implements run by using renewable resources. It's a great promotion of industries to reduce usage of fossil fuel and decrease the rate of greenhouse gas in the environment. CNH is also a long-term sustainability planner, working on long-term planning with corporate people for Environmental sustainability is the first priority in its planning. It has been promoting the usage of renewable resources by promoting energy obtained from biomass converted from agricultural and domestic wastage. The company has offered farmers a choice to reduce fossil fuel consumption by adopting sustainable agriculture technology. This was achieved by using biomass energy as a fuel resource in their agriculture implements. Farmers make their own bio-fuel from domestic and agriculture waste, which help their economy and reduce the emission of carbon particle in the environment. CNH has adopted four key pillars of their clean leader technology: Bio-diesel, Ethanol, Biomass, and Hydrogen-Energy.

## **3. ENERGY PRODUCTION BY WASTE**

Today's environmental challenges are how to decompose or recycle the waste products. Increasing population pressure, urbanization and industrialization are contributing to more and more wastes being released by industries and household. Industries are coming forward to use these garbage as an energy source. CNH has been manufacturing agricultural implements based on biofuel engine. These implements use bio-fuel as an energy source. Bio-fuel is being made by decomposing agricultural crop wastes such as straw from paddy field, maize, cotton and oil seed ([www.climateactionprogramme.org](http://www.climateactionprogramme.org)). This new pattern of energy use prevents environmental pollution. Air pollution occurs by burning of stubble of crop residue left over after the harvesting the crop. By this leftover-crop, residue usage produced an average 45 megawatt of energy. ([https://en.wikipedia.org/wiki/New\\_Holland\\_Agriculture](https://en.wikipedia.org/wiki/New_Holland_Agriculture)). Since 2006, CNH for the first time approved 20% biodiesel (B20) in all farm machinery containing its engine. In 2007 it has offered 100% (B100) in tier three engines.

### **3.1. Output Sources**

In 2007, for the first time Hydrogen powered NH2 tractor was tested at La Bellota, Turin, Italy rolling out first energy independent farm machinery in home plant in Italy. In 2009 international agriculture business show SIMA was organized in Paris. In this show CNH, NH2 hydrogen engine based tractor was awarded the gold medal. It was a great achievement by an industry to promote a new energy independent farming technology. The hydrogen-based engine produces only heat, vapor, and water, but not any greenhouse gases.

## **4. BIO-ENERGY**

Renewable energy is a good source of energy if we work on reducing the emission of greenhouse gases. It is also a longterm solution of zero emission of carbon particle ([www.arena.gov.au](http://www.arena.gov.au)). Bio energy is being obtained from organic matter made up by trees, plants, stubble of crop, human domestic wastage and industrial waste (Meshram JR et al., 2007). Bio-fuel is playing a key role to decrease the demand for fossil fuel and also decreasing the emission of greenhouse gases. Currently, bio-fuel production would grow 2% but if we see the demand of bio-fuel it may be near about 27% in 2050 ([www.iea.org](http://www.iea.org)). Stubble burning is the main cause of carbon particle emission. CNH produces energy from crop stubble wastage namely paddy, maize, cotton. And by this process reduces the negative impact of stubble burning on the environment. In Brazil, CNH is partnering with Centro de Tecnologia Canavieira (Sugar Cane Technology Center-CTC) for promoting complete range of agriculture implements using bio-energy as a source of energy. It uses mainly stubble from sugarcane, overtaking the traditional method of energy produced by ethanol. Unlike fossil fuel that takes

millions of years to be formed, bio-fuel is formed in a shorter period of time. Bio-based industries are growing rapidly in the market and show high economic growth rate. Bio-based products are mainly called green products, which do not harm the environment. Energy produced by bio-fuels has mainly zero emission of carbon. Bio-energy sources in developing nations play a vital role in contributing economy. These resources are an extra source of income for farmers and forest dwelling people.

## 5. CLEAN ENERGY

For fulfilling the overall demand for energy globally, fossil fuels were consumed rapidly by developed and developing countries causing pollution.

CNH is adopting clean technology in their agriculture implements proceeding to sustainable farming in future ([www.agriculturenewholland.com](http://www.agriculturenewholland.com)). Case New Holland has achieved active promotion in use of renewable energy in their manufacturing agriculture implements.

Now a days, CNH leads in manufacturing engines running on 100% bio-diesel. Before launching the 100% bio-diesel engine tractor it has confirmed its reliability by running non-stop 500 hours. ([www.thecleanenergyleader.com](http://www.thecleanenergyleader.com)).

Second generation bio-fuels, jatropha, bio-ethanol secondary source of energy mainly environment-friendly easily to generate in short time. CNH has come forward to create research on renewable energy resources. The research on hydrogen-based engine tractor is its ultimate step for conservation of energy. The Hydrogen engine based tractor produced 100% of power to machinery for a run. They attained an unique position in the market for developing this type of tractor. For the development of hydrogen-based tractor, the company had the support of Fiat group for adopting advanced sources of energy. In 2006, they made bio-diesel tractor for agriculture purpose and promoted the product around the world. NH2TM hydrogen power tractor promoted in 2009 presents concept of energy independence.

In 2010, New Holland introduced Tier four technology having SCR "Selective Catalytic Reduction and SCR mainly reduces the pollutant contents released when the engine works. To reduce the emission of harmful gases the SCR technology is used in diesel engine transport and it is cost and fuel efficient. SCR is helping the engine to work more efficiently by converting NOx released outside the engine to nitrogen and oxygen. It does not affect the performance of an engine. After treating diesel with SCR technology, it separates the engine from the main part of the body, but has no effect on the horsepower of the engine. Exhaust gases released outside the engine does not circulate into the engine again.

SCR technology is highly beneficial in agricultural implants products by increasing the efficiency and power of an engine ([www.agriculturenewholland.com](http://www.agriculturenewholland.com)). Thus CNH had used SCR technology in their

product, powering more engines and making fuel efficient tractors around the world. ([www.climateactionprogramme.org](http://www.climateactionprogramme.org)).

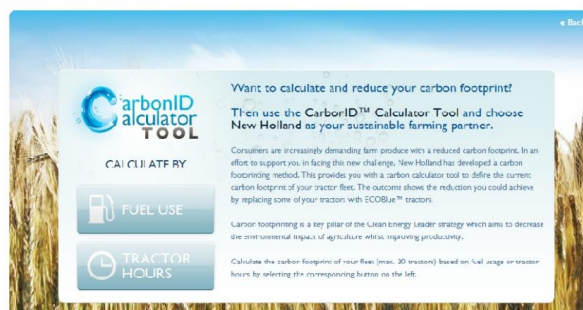
## New Holland is Environmentally Friendly Company

New Holland Agriculture - a brand of international repute - has been serving global agriculture for 120 years.

Case New Holland was helping to rethink the world on sustainable economic growth. It has shaped the world model based on advanced technology and this advanced technology was being used in their manufacturing industries for further research and development. They help in shifting the industrial mind towards the more sustainable growth of the business. The company has developed a model to solve the problems of a farmer by sustainable agriculture. A tool CARBONID was successfully designed by New Holland to calculate carbon emission by fuel used in farm Implements'. (Source:

[www.carbonid.newholland.com](http://www.carbonid.newholland.com))

CARBONID™ CALCULATOR



It has also promoted the farmer to develop energy by using renewable resources Today, CNH does not work only with the energy but it goes with corporate and long-term economic growth of industries. It's work and commitment on various aforementioned projects highlights environmentally friendly practices. These practices are currently not being widely adopted in India but are considered due to the shortage of fossil fuel, and pollution and climate change. This company provides an ideal example of initiating a best practice in industrial ecology. Such studies are required for other agricultural implements manufacturing companies and provide motivation to initiate such studies.

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