Greenhouse Gas Reduction Enabled by Trimble Solutions

February 2019

Introduction

Trimble solutions are designed to bring transformative productivity improvements to our customers, by connecting, automating, and improving the precision of, our customer's workflows. By connecting the digital and physical worlds through technology solutions that include, and connect, hardware and software, our solutions help customers reduce and eliminate scrap, rework, labor, fuel, and other valuable resources (such as fertilizer, water, herbicide, and pesticide in the case of agriculture). In addition, our solutions improve our customers' project quality, safety and time to completion, bringing further benefits to our customers and their projects.

Although a number of benefits are achievable through our solutions, it is difficult to quantify precisely how much of each type of benefit has been achieved on any single project. For example, our customers' projects do not have comparison control groups for which precise comparisons of productivity can be made. In addition, there can be a variety of factors that affect the productivity of a given jobsite, whether it's a construction site, a farm, or the delivery of a cross-country shipment via ground transportation.

We have endeavored herein to provide estimates of greenhouse gas emissions reduction, based on reduction in fuel usage, that is made possible in certain industrial applications that use our technologies, including agriculture, civil construction, and transportation. These estimates reflect internal estimates based on analysis, experience, and are supplemented by external data, where possible. These estimates are based on a number of individual assumptions, and have not been audited or validated by any third party.

Responsible corporate citizenship begins with the value we deliver to our end markets

Productivity	Quality
Earthworks productivity	Reduction in project duration
Reduced survey and engineering time	Reduction in unique building components
Increased fleet utilization	Reduction in space planning & management costs
Safety	**Environmental sustainability**
Construction site safey	Lower fuel consumption
Regulatory compliance	Reduced water use
Fleet safety	Offset credits generated for farmers

Quantified

Not Quantified

Trimble Solutions Reduce Greenhouse Gas Emissions

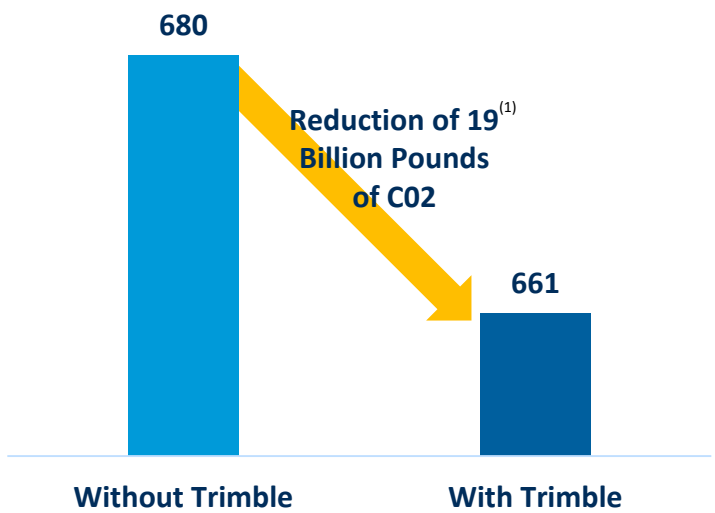
Greenhouse Gas Reduction

Construction

Agriculture

Transportation

Annual Pounds of Carbon Dioxide Usage (in billions)

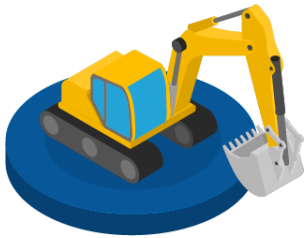


(1) Equivalent to 8,716 thousands of metric tons, based on 2,204.62 pounds per metric ton.

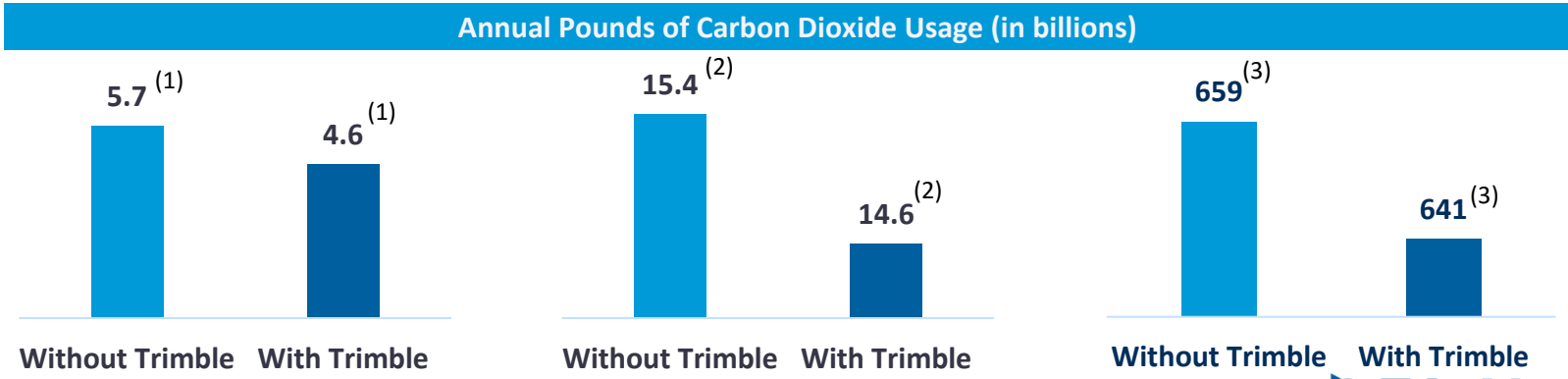
Trimble Solutions Reduce Greenhouse Gas Emissions (cont.)

Solution Benefits

Construction	Agriculture	Transportation
Fewer passes on civil jobsite yields reduced machine time	Most efficient field navigation, maximizing fuel efficiency	Improved capacity utilization, route optimization



Greenhouse Gas Reduction



1. Reflects internal estimates and is based on a number of assumptions, including: (1) the number of bulldozers, motor graders and excavators, that utilize Trimble machine control technologies, (2) annual hours of machine usage, (3) average gallons of fuel consumption per hour, and (4) pounds of carbon dioxide per gallon of diesel fuel.
2. Reflects internal estimates and is based on a number of assumptions, including: (1) the number of tractors that utilize Trimble guidance technologies, (2) annual hours of machine usage, (3) average gallons of fuel consumption per hour, and (4) pounds of carbon dioxide per gallon of diesel fuel.
3. Reflects internal estimates and is based on a number of assumptions, including: (1) the number of trucks that utilize Trimble route planning and capacity utilization technologies, (2) annual miles driven per truck, (3) average gallons of fuel consumption per mile, and (4) pounds of carbon dioxide per gallon of diesel fuel.

Trimble Solutions Reduce Greenhouse Gas Emissions - Detail

	Pounds of C02 Emitted Per Year		
	Without Trimble Solution	With Trimble Solution	Difference
Civil Machine Control Systems (1)			
Bulldozers	2.7	2.2	(0.5)
Motor Graders	0.9	0.7	(0.2)
Excavators	2.1	1.7	(0.4)
Subtotal	5.7	4.6	(1.1)
Agriculture Guidance Systems (2)			
Agricultural Tractors	15.4	14.6	(0.8)
Subtotal	15.4	14.6	(0.8)
Transportation & Logistics Route and Capacity Optimization (3)			
Trimble MAPS (ALK + Appian) Routing, Navigation, and Fleet Optimization	466.7	455.0	(11.7)
PeopleNet Route and Capacity Utilization	78.8	74.3	(4.5)
TMW Load Optimization	113.3	112.2	(1.1)
Subtotal	658.8	641.5	(17.3)
Total	**679.9**	**660.7**	**(19.2)**

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