

Energy Demand for Pumps and Tractors

Tractors

Level 1

In level 1 there is no further improvement in efficiency of tractors. Diesel usage remains at 4.5 liters per hour. Total diesel demand reaches to 3.8 TWh by 2050 from 0.4 TWh in 2015.

Level 2

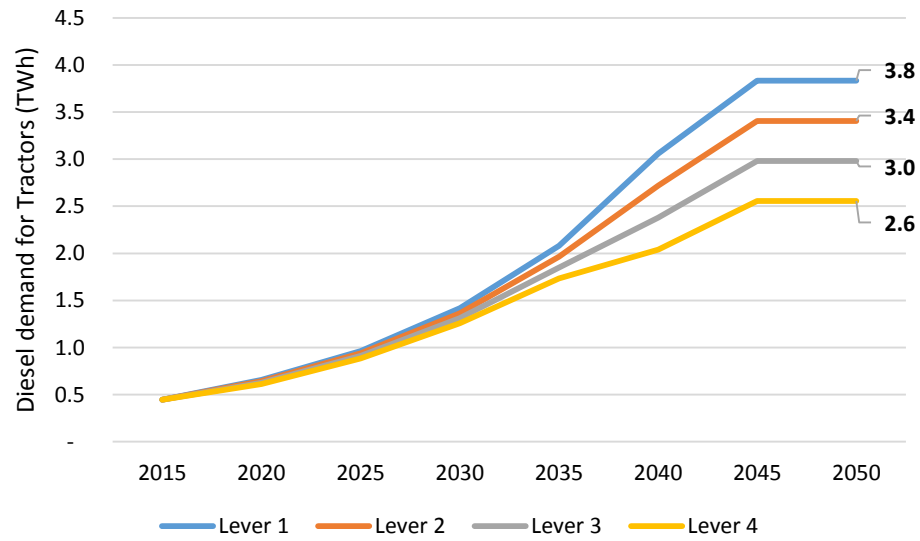
There is slight improvement in efficiency of tractors. The demand for diesel reaches saturation at 3.4 TWh. The specific energy consumption improves to 4 liters per hour till 2040 and then remains same thereafter.

Level 3

Level 3 assumes that specific energy consumption will further improve. This could be because of various measures taken by policy makers, like more stringent standards will be in place to improve the specific energy consumption in tractors. The diesel demand grows to 3.0 TWh by 2045 and remain same thereafter.

Level 4

Additional policy measures for improving specific energy consumption might come in place. This can include policies like new standards to restrict sales of inefficient tractors and deregulation on diesel prices for agriculture sector. The specific energy consumption improves to 3.5 liters per hour till 2040 and then remains same thereafter. The Diesel demand grows to 2.6 TWh by 2045 and remains same.



Total number of tractors in the state was about 34 thousand in 2015 and it has doubled between the period 2010-2015. Given the government's focus on improving farm productivity and the fact that only 12% of potential market has been captured till now, this trend is expected to continue. This means that complete farm mechanization will reach by 2045 and penetration of tractor will reach to its full potential by then. Total annual demand for diesel from tractors is estimated to be about 0.03 million tons (MT) in 2015.

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Pumps

Level 1

In Level 1, electrical pumping efficiency improves by just 7 percent as pump replacements might not pick due to lack of support mechanisms, while diesel pumps don't improve at all.

Level 2

Electrical pumping input improves by 18 percent and diesel pumping by 8 percent. This could be because of Ag-DSM, and various complementary watershed development programs meet with limited success.

Level 3

Pumping input requirement improves by further 29% results, which could be as a result of aggressive replacement of old pumps, slow increase in agricultural tariffs and improvement in reliability of power supply.

Level 4

Level 4 envisages modern practices and vertical farming which can optimize water-usage, in response to growing demand on agricultural sector and scarcity of water resources. Electrical pumping takes place at optimum loads, reducing losses and resulting in best efficiencies. Diesel pumps achieve optimum efficiencies too, and weighted improvement in pumping consumption is 38 %.

