

## **2009 IPLOCA New Technologies Award Submission**

The Caterpillar D7E is the first of its kind with Electric Drive. This Diesel-Electric hybrid technology uses a diesel engine to drive an electric generator that powers two AC electric drive motors. The D7E track-type tractor (bulldozer) increases dozing efficiency by 25%, reduces fuel consumption by 10% to 30%, and reduces gaseous emissions. The total emissions reductions, from productivity increase and fuel savings, per hour for the D7E compared to the current D7R Series II are 10% for CO, 20% for NOx and HC, 51% for PM, and 23% for CO2.

The productivity and fuel consumption gains are a result of optimizing the engine size, operating range and rated speed as a result of the electric drive train; higher overall efficiency for the electric drive train compared to the powershift drive train; lower overall machine parasitics due to system integration; and overall operating efficiency improvements due to continuously variable nature of the electric drive train.

The D7 size class has long been popular with pipeline contractors. This innovative technology not only helps contractors realize machine efficiency, but also aids contractor efforts to meet growing environmental regulations and demands.

In addition to the environmental benefits, improved visibility from the cab, operator comfort and enhanced machine maneuverability contribute to more productivity and efficiency on the jobsite. Comfort and visibility also aid better overall jobsite safety.

The electric drive design has fewer moving parts than traditional systems, and offers longer component life. When replacement time does come, the major structures and components on the D7E are built to be rebuilt, further reducing waste and replacement costs.



