

Engineering Sustainability

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Abstract:

The world population doubled from 3 billion in 1960 to 6 billion in 1999. In 2012 it passed 7 billion. Yet we all still live on the same planet and compete for the finite resources it provides. This is a challenge that can be met by rapidly improving the productivity of our resources. The industrial revolution made labor productivity improvements that allowed people to flourish, and the resource revolution will sustain us going forward.

Sustainability is an approach that can help drive this resource revolution. Sustainability is not a compromise, but an optimization exercise. We don't have to choose between people, profit, and the planet – we can find solutions that enhance all three areas. Living sustainably is not a sacrifice, and it actually results in a higher quality of life. For businesses, improved productivity generally means increased profits. Sustainability is another measure of productivity – the productive use of resources.

In this presentation we will define sustainability, show how to measure it, and discuss several design examples of how it has been engineered into projects. These projects have all significantly reduced operating impact and cost, and did so with little to no additional financial investment. The additional investment was simply in good design. Engineers will play an increasingly important role in spreading good design practices and improving the quality of life for everyone. Optimization is something that engineers are good at, so it's a natural fit.

Biography:

Paul Westbrook is the Sustainable Development Manager for Texas Instruments. He has worked for TI since graduating from LSU with a BSME in 1982. He led the sustainable effort for TI's 300 mm semiconductor manufacturing plant in Richardson, TX, which was the first LEED Gold Certified Fab in the world. Paul is a LEED Accredited Professional and a Senior Member of the Technical Staff at TI. In 2011 he was named a Senior Fellow with the US State Department's Energy and Climate Partnership for the Americas program. As Senior Fellow, he visited Honduras, Bolivia, and Peru to assist governments and industries with sustainability.

Paul designed his own passive/active solar home, which won the 1996 NAHB Energy Value Housing Award for Innovative Design. He installed a 1.8 kW wind turbine in his lawn in 2006 and a 3.3 kW solar array on his roof in 2012. In 2009 Paul was named the first Water Genius Award Winner by the North Texas Municipal Water District and was also awarded the national Zeftron Sustainable Practices Award.

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