

# Creating Greater Need for Advanced Eco-Tec Produced Water Treatment

Despite a significant improvement in world supply and wavering demand around the world, oil prices are likely to stay high for the foreseeable future, said the International Energy Agency (IEA) in May.

That outlook bodes well for technologies facilitating Enhanced Oil Recovery (EOR) efforts, such as Eco-Tec's Produced-Water Treatment systems, as higher prices drive investment in exploration, development, and production of unconventional reserves.

Geopolitical risks – such as threats of war and political tension in the Persian Gulf, Libya, and Iraq; protests in Nigeria and Russia; and management challenges in Venezuela – are ongoing sources of uncertainty for speculators and are what is fundamentally driving up oil prices. “The path of market fundamentals for the rest of the year remains highly uncertain and geopolitical risks will likely continue to keep prices high,” the IEA said.

The agency, advising 28 industrialized nations on energy policy, said global oil supply rose 600,000 barrels per day (bpd) to 91 million bpd in April and was now 3.9 million bpd over year ago levels, with 90 percent of the increase coming from OPEC.

### Shift Toward Unconventional Reserves

With oil prices high and industrializing nations, such as China and India, fueling demand, supply will remain under pressure. This incentive to uncover more sources of oil has created a dramatic shift in attention toward unconventional reserves and new technologies that cater to non-traditional methods of extraction.

According to the recent U.S. Energy Information Administration's (EIA) outlook on supply, unconventional oil is projected to grow by over 650% from 2003 to 2035, and more than triple from today's levels. By 2035

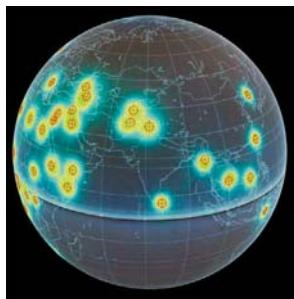
unconventional liquids will be responsible for a sizeable 12.2% of global supply. And much of this is expected to come from oil sands and extra-heavy oil. In fact, it is estimated that Venezuela's Orinoco Belt and Canada's Athabasca Oil Sands hold just as much oil reserves as all the conventional reserves in the world combined.

The majority of these heavy-oil operations involve in-situ extraction techniques; among the most common being Steam-Assisted Gravity Drainage (SAGD), steam flooding, and cyclic steam. With these growing techniques requiring vast amounts of water to produce steam for injection into formations, water itself is becoming a highly sought-after resource for oil producers. And with water-conservation measures and environmentally responsible practices swiftly moving forward, in many parts of the world, water consumption by oil operators continues to be closely scrutinized.

The value of water for unconventional heavy-oil production is especially pronounced in expanses of desert in the Middle East. In the Arabian desert, no fresh-water sources exist, presenting great challenges for generating steam for extraction. However, with 25 billion barrels of heavy oil reserves potentially available there, it's worth the challenge. If exploited, certain heavy-oil deposits just being developed now could become the largest operating steam projects in the world – ultimately able to extract around 1000 billion barrels of heavy oil, an equivalent of 30% of world reserves in the Middle East.

### Produced Water a Key Resource

Produced water, then – a more reliable, environmentally responsible source of boiler feed – is becoming a key



*Geopolitical risks are ongoing sources of uncertainty -- driving up oil prices. With supply under pressure, growing unconventional oil operations are making produced water a key resource.*



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resource for steam-based heavy-oil extraction.

It is by far the largest volume byproduct or waste stream associated with oil and gas exploration and production. Approximately 21 billion bbl of produced water are generated each year in the United States from nearly a million wells, and more than 50 billion bbl of produced water are generated each year at thousands of wells in other countries (Clark and Veil 2009).

By improving the quality of produced water through specialized treatment, it can be fed to a Steam Generator (boiler) to make steam for injection (or for disposal purposes), thereby eliminating the need for using up sensitive lakes, streams, and other fresh-water sources.



*Unconventional oil production operations, particularly in California's growing heavy-oil sectors, are demanding safer, more efficient treatment systems that can cut down on operational costs. (Above) Eco-Tec's advanced micro-media filters and ion-exchange softeners installed throughout California are addressing operators' concerns, in a big way.*

These evolving factors – the trend towards unconventional oil, new steam-based extraction methods, and strengthening fresh-water conservation measures – are greatly highlighting the need for more advanced produced-water treatment solutions. As unconventional oil producers grow their operations, they are demanding safer, more efficient treatment systems that can cut down on operational costs, compared to conventional systems.

### **Better Treatment Now in Demand**

This can be clearly seen throughout California's steadily growing crude-oil production regions, where, among the drawbacks of typical produced-water systems, is the need for costly hydrochloric acid (HCl) followed by caustic soda (sodium hydroxide, NaOH), for regeneration of produced water softeners. The handling of these products adds substantial costs, safety hazards, greater regulatory requirements, and the need for corrosion-resistant alloys in construction of the processing equipment, which requires considerable space and site assembly.

Eco-Tec's technology has addressed these glaring problems, in a big way. In a span of just over two years, Eco-Tec has provided seven heavy-oil operations in California with new produced-water treatment systems – softening water at a total capacity of about 81,500 barrels/day (13,000 m<sup>3</sup>/day) in that state alone.

The successful adoption of Eco-Tec's equipment in California is directly related to its advanced technology that eliminates the use of acid and caustic for regeneration and provides a 40%-80% reduction in salt and waste from regeneration compared to conventional softeners. The Eco-Tec equipment is also more compact, has a smaller footprint, and is fully automated for simple operation – also driving factors behind projects there.

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***For more on Produced Water Treatment, visit [www.eco-tec.com](http://www.eco-tec.com)***

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