



**WORLD'S ONLY DOWNHOLE STEAM GENERATOR  
FOR HEAVY OIL EXTRACTION**

**NOVEL, DISRUPTIVE AND GAME-CHANGING**

[esteamoil.com](http://esteamoil.com)

# PROBLEM – CONVENTIONAL SURFACE STEAM GENERATOR

## Once-Through Steam Generator (OTSG) – 1960's Vintage Design

- ✗ Antiquated and Inefficient
- ✗ Same basic design since early 1960's
- ✗ Not economical in a low oil price environment
- ✗ Very high heat loss on the surface and wellbore
- ✗ Low quality steam in the reservoir above 2,000 ft.
- ✗ 50-60% of operating expenses is for fuel (natural gas)
- ✗ Poor economics due to high Steam-Oil Ratio
- ✗ High production cost per barrel of oil
- ✗ High water treatment cost for zero hardness fresh water
- ✗ Substantial Greenhouse Gas (GHG) emissions
- ✗ Continuous maintenance increases costly downtime



# SOLUTION - DOWNHOLE STEAM GENERATOR



Transformative and Game-Changing - **World's Only Downhole Steam Technology**

- ✓ Significant reduction of Greenhouse Gas (GHG) emissions
- ✓ World's first to accurately estimate steam quality at the reservoir
- ✓ Delivers superheated steam in the reservoir below 2,500 ft.
- ✓ Precise control of quantity and quality of steam injected
- ✓ Optimum steam injection maximizes the oil recovery
- ✓ No heat loss of steam flowing down the injection wellbore
- ✓ Less sensitive to water quality that reduces treatment cost
- ✓ Superior steam distribution enhances more oil production
- ✓ More heavy oil recovery at a faster rate increases profit
- ✓ Minimal maintenance helps reduce costly downtime
- ✓ Off-the-shelf end-to-end complete functional system
- ✓ Closed-loop system on the surface and in the wellbore
- ✓ No moving parts in the wellbore



Surface Equipment on the Pad Site





# VALUE PROPOSITION

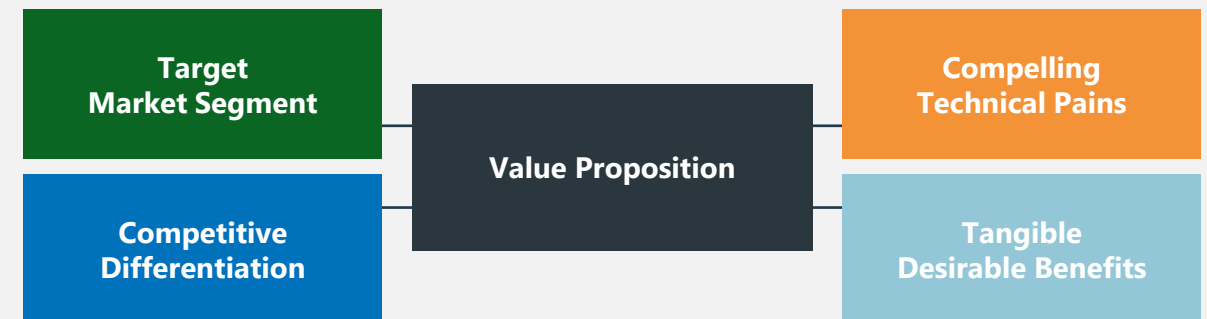


## eSteam™ technology will be very attractive to its customer base

- ✓ Improved energy-efficient heat delivers energy cost savings.
- ✓ Achieves predictable and controlled steam quality in the reservoir.
- ✓ High-quality steam or superheated steam delivered to heavy oil reservoirs below 2,500 ft.
- ✓ Better economics by achieving a lower Steam-Oil Ratio (SOR).
- ✓ Reduces production cost per barrel of oil.
- ✓ Eliminates heat loss of the wellbore steam and maintains steam quality.
- ✓ Advantageous steam technology in a low oil price environment.
- ✓ World's first to estimate the steam quality at the reservoir.
- ✓ Increases proved oil reserves that are technically recoverable.
- ✓ Very simple, reliable and effective thermal EOR solution.
- ✓ Off-the-shelf proven end-to-end integrated turn-key system.
- ✓ Fully automated system remotely operated from an iPad or desktop computer.

## More Oil Production + Lower Costs = Higher Profit Margins

- ✓ eSteam™ generates high-quality steam downhole that achieves less fuel per barrel of water to convert to steam, fewer greenhouse gas emissions, and lower operating expenses than an antiquated conventional surface steam generator - OTSG.
- ✓ eSteam™ is committed to deliver best-in-class heavy oil steam generation.
- ✓ **Mission Statement** - **To seamlessly integrate the eSteam™ technology to provide cost-effective, value-added solutions to the heavy oil industry.**
- ✓ **Future Energy's motto is: More Effective Delivery of Energy Efficient Steam to Economically Produce Heavy Oil and Oilsands.**



## eSteam™ has unmatched benefits compared to a Once-Through Steam Generator (OTSG)

- Zero-emission hydrogen heater
- ~\$19.00/bbl. all-in production cost
- ~50% less fuel per barrel of steam
- ~25% lower operating expenses
- ~60% lower capital equipment cost
- ~45% less water per day to deliver rated heat output
- No moving parts in the wellbore
- Steam injection from 800 to 6,000+ ft.
- Lower Steam-Oil Ratio (SOR)
- Less water converted to steam to produce one barrel of oil
- No wellbore heat loss of steam
- Delivers steam to deep reservoirs
- Precise steam quality injected into reservoir
- Fully automated system from an iPad / laptop
- Nanofluid improves flow assurance near wellbore
- Nanofluid remediates asphaltene in well & perms
- eSteam optimizes steam injection reducing steam cost
- Downhole steam created in existing SAGD and vertical wells
- Improves steam distribution in the reservoir
- Improves mobility ratio by enhancing areal sweep efficiency
- Tolerates high TDS water
- Minimal heater maintenance reduces downtime
- Closed-loop system on the surface and in the wellbore
- Increases technically recoverable proved oil reserves
- Reduces production cost per barrel of oil recovered
- In-situ oil upgrading for a higher-value oil
- Precise temperature control improves heat efficiency
- Zero emission hydrogen heater is scalable up to 120

MMBtu/hr.



**eSteam™**

## CONTACT INFORMATION

[info@esteamoil.com](mailto:info@esteamoil.com)

Technology Website: [esteamoil.com](http://esteamoil.com)