

## Independent Catalyst Test (ICT) Report – Recent examples of benefits delivered

Refiner	Unit	Incumbent out	Challenger in	Issue	Performance benefit	Cat cost savings,	contact
<b>CHS Inc.</b>	Laurel, MT VGO	Criterion	Albemarle	Short cycle undiagnosed by incumbent	6 month cycle to 2 year cycle	\$2 million	Shane Lacasse(406) 628-5439
<b>CHS Inc.</b>	Laurel, MT ULSD	Criterion	Topsoe	ICT Report showed opportunity	3-tier improvement	\$1 million	Shane Lacasse(406) 628-5439
<b>PBF Energy</b>	Paulsboro, MD ULSD	Albemarle	Topsoe	ICT Report showed opportunity	2-tier improvement	\$200,000 plus price cuts on FCC catalyst	Jacki Strauss (856) 224-6150
<b>PBF Energy</b>	Toledo, OH VGO	Albemarle	Topsoe	Short cycle undiagnosed by incumbent	2-tier improvement	\$330,000 plus price cuts on FCC catalysts	Kirk Miller (419) 410-0570
<b>Suncor Energy</b>	Commerce City, CO VGO	Criterion	Topsoe	ICT Report showed opportunity	1- tier improvement	\$600,000	Mark Archer (403) 296-3097
<b>Hellenic Refining</b>	Athens, GR VGO	Albemarle	ART	Short cycle undiagnosed by incumbent	1-tier improvement	\$500,000	Stilianos Kiriakau +30 (210) 5536366

Notes: 1) 1-tier improvement = 10°F start of run temperature 2) FCC cost savings comes from proving credibility of dual-source strategy

# Hoekstra Trading – Suncor delivery summary

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## Independent Catalyst Test Report 2012, Suncor 6-month delivery summary

### Facts from ICT Report 2012 that should soak into consciousness

- Competitive catalysts are more alike than is generally perceived (only 10°F difference among the catalysts we tested in 2012).