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## PERP 2016S12: Petroleum Coke

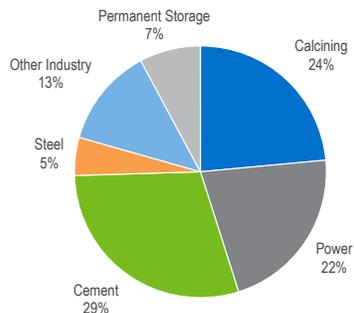
“Petroleum Coke” is one in a series of reports published as part of the 2016 Process Evaluation/Research Planning (PERP) Program.

### Report Overview

Petroleum coke (petcoke) is a refinery byproduct of the delayed coking process. Over the last 10 years, petcoke production has grown alongside increases in refining capacity. Although delayed coking is a mature technology, it remains an important residue conversion process that refiners continue to select as an integral part of modern, profitable refinery configurations.

Petcoke is not a single product; it is produced with a wide range of specifications that depend on the nature of the feedstock. At a primary level, petcoke can be categorized into low sulfur and high sulfur petcoke. High sulfur petcoke is predominantly used as a fuel in either the cement or power industry. Low sulfur coke can be used in a variety of other applications but the majority is consumed by aluminum and steel manufacturing.

### GLOBAL PETROLEUM COKE DEMAND BY END USE



This PERP report provides an overview of commercial petcoke production and utilization options, including process technologies, technical barriers and basic production guidelines. The following issues are addressed in the report:

- What are the major potential uses for petcoke?
- Can regional demand for low sulfur petcoke be met? What options do refiners have for producing higher value grades?
- Are there options for producing higher value products from petcoke? What are the potential benefits?
- Which regions produce petcoke? How do they balance global trade?

### Production Technologies

As refiners invest in coking technologies, cost effective use of this important byproduct can potentially provide profitable alternatives in how a refinery is powered and also what grade of petcoke is produced. Ultimately economic investment criteria govern the feasibility of any potential project on a case by case basis with key regional differences also playing a role.

This report details the potential uses of high sulfur and low petroleum coke, as well as the processes and chemistry related to their production. It also provides refiners and users of petcoke with an informed view of how petcoke can be utilized to increase potential value.

### Process Economics

Cost of production estimates for the production of calcined petcoke for anode use as well as economics of producing low sulfur feedstock from high sulfur crude oils are presented. A comparison of the potential uses of petcoke for power generation and production of methanol via gasification are also examined.

### Commercial Market Review

Global demand for high sulfur petcoke is projected to reach 98 million tons by 2025, driven by fuel applications. Demand for low sulfur petcoke is driven by global aluminum consumption and the use of calcined petcoke in aluminum smelting. Global demand for calcinable green petcoke is projected to reach 47 million tons by 2025.

This PERP report provides an overview of the supply and demand of petcoke on both a global and regional basis.

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