

**Report to Congress**  
**Aluminum Refining, Processing, and Manufacturing**



**Under Secretary of Defense  
for Acquisition and Sustainment**

**October 2022**

The estimated cost of this report or study for the Department of Defense is approximately \$5,870 in Fiscal Years 2022 - 2023. This includes \$1,840 in expenses and \$4,020 in DoD labor.

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## Introduction

This report is prepared pursuant to section 852 of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116-283). Section 852(b) requires the Secretary of Defense to submit a report to the Committee on Financial Services of the House of Representatives and the Committee on Banking, Housing, and Urban Affairs of the Senate. Such report should include information on how authorities under the Defense Production Act (DPA) could provide incentives to (1) increase domestic activities related to aluminum manufacturing and processing and (2) whether a new initiative would advance domestic aluminum processing and manufacturing.

## Defense Production Act Authorities

The DPA authorizes the President to ensure the availability of domestic sources to meet U.S. defense, essential civilian, and homeland security requirements. DPA Title I authorizes the prioritization of materials, services, and other supplies to federal contracts over other orders, as well as controlling the distribution of scarce materials within the civilian economy. DPA Title III authorizes the President to provide broad-based economic incentives, such as grants, contracts, loans, or loan guarantees; to create, maintain, protect, expand, or restore domestic industrial capabilities. DPA Title VII includes administrative provisions under the DPA and select authorities to review foreign investment in the United States and voluntary agreements among industry to implement national emergency preparedness plans.

### *Title I—Priorities and Allocations System*

The Department of Commerce has delegated Department of Defense (DoD) the authority under the Defense Priorities and Allocations System (DPAS) to place priority ratings on DoD contracts. DPAS is designed to be a self-enforcing system, in which priority ratings placed by the DoD are flowed-down by the prime contractor to its sub-tier suppliers, *ad infinitum*, to ensure that defense orders receive priority over commercial orders.

DoD issues approximately 300,000 to 400,000 DPAS rated orders every year, which already cover those end-items into which aluminum is incorporated.

### *Title III – Expansion of Productive Capacity and Supply*

The President is authorized to make Determinations under DPA Title III to reduce current or projected shortfalls for industrial resources, critical technology items, or essential materials that are needed for the national defense. Subject to the availability of appropriations and other limitations on the aggregate obligation incurred by the Federal Government, such Determinations provided for the issuance of loans, loan guarantees, grants, contracts, subsidies, and other economic incentives to address such shortfalls.

Unless otherwise waived by Congress<sup>1</sup> or by the President<sup>2</sup>, all DPA Title III actions are subject to a three-part test that provides the justification for the proposed action. This test includes the following (ref: 50 U.S.C. 4533):

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<sup>1</sup> Such as section 4017 of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) (Public Law 116-136) (ref: 50 U.S.C. 4533(a)(7)(A)).

<sup>2</sup> See 50 U.S.C. 4533(a)(7)(B)

- (a)(5)(A): the industrial resource, material, or critical technology item is essential to the national defense;
- (a)(5)(B): without Presidential action under this section, United States industry cannot reasonably be expected to provide the capability for the needed industrial resource, material, or critical technology item in a timely manner; and
- (a)(5)(C): purchases, purchase commitments, or other action pursuant to this section are the most cost effective, expedient, and practical alternate method for meeting the need.

(a)(5)(A) – Essential to National Defense

Aluminum plays a critical role in the aerospace, transportation, and construction sectors of the U.S. economy. After steel, aluminum is the second most consumed metal globally, and defense consumption of aluminum represents about 5 percent of aggregate domestic demand (i.e., [REDACTED]). However, this low concentration of demand does not necessarily hold for select grades of high-purity aluminum (HPA) metal.

HPA is a low-iron / low-silicon form of primary aluminum metal that is used in the production of 7000- and 2000-series alloys that, ultimately, are fabricated into parts for tactical wheeled vehicles, tracked and wheeled combat vehicles, space launch systems, and commercial and military aircraft. In general, defense demand for HPA as a function of U.S. HPA consumption ranges between [REDACTED] percent and [REDACTED] percent per year. Defense applications for HPA include, but are not limited to, the F-35, F/A-18, Falcon 9 Space Launch System, and the Joint Light Tactical Vehicle.

Due to the availability of aluminum metal from domestic sources (primary smelting and recycling) as well as imports from close United States allies (e.g., Canada), DoD has not found shortfalls for aluminum metal through its biennial assessment on defense and essential civilian needs under various national emergency scenario conditions (ref: 50 U.S.C. 98h-5). However, repeated analyses under 50 U.S.C. 98h-5 by the National Defense Stockpile program have identified significant shortfalls for HPA under these various national emergency scenarios.

The *Strategic and Critical Materials 2021 Report on Stockpile Requirements* identified a net shortfall of [REDACTED] over a four-year period, which has a market value of [REDACTED] today. Updated shortfall estimates, covering both commodity-grade aluminum and HPA will be made available to Congress in the *Strategic and Critical Materials 2023 Report on Stockpile Requirements*, expected in the second quarter of fiscal year 2023 (ref: 50 U.S.C. 98h-5).

The principal driver risk to the HPA supply chain is a combination of [REDACTED] and (2) outsized foreign reliance. This larger domestic producer idled HPA production in July 2022, and the only remaining foreign sources of HPA operate in New Zealand, the United Arab Emirates, Russia, and (to a much lesser extent) Canada.

Consequently, DoD believes that HPA is essential to national defense.

(a)(5)(B) – Industry Cannot Reasonably Provide the Capability in a Timely Manner

Due to competition from foreign sources with lower energy and / or labor costs, subsidies, and other factors, U.S. aluminum production has substantially declined from the end of the Cold War to



present. In 1993, the United States had 22 active aluminum smelting facilities; today, there are only five. This decline in domestic primary aluminum production was one of the key drivers of the investigation on the national security impact of imported aluminum, under section 232 of the Trade Expansion Act (“Sec. 232 tariffs”).

Following the imposition of tariffs on imported aluminum, several U.S. smelters announced plans to re-start or expand primary production in the United States. Concurrent with or after this investigation, select primary aluminum smelters applied for economic incentives under the DPA Title III to sustain or expand HPA production. At that time, DoD did not have the authority (e.g., a Presidential Determination) or sufficient funding to support such efforts. Notwithstanding the absence of an economic incentive from the DPA Title III program, domestic aluminum smelters obtained private sector capital to execute many of these proposed projects.

Following Russia’s invasion of Ukraine, United States and global energy prices have experienced significant volatility. This is critical for primary aluminum production because, under normal market conditions, the cost of energy comprises about 40 percent of an aluminum smelter’s operating expense. Though many aluminum smelters have been able to manage rising energy costs through internally generated power (e.g., hydroelectric facilities) or long-term energy contracts concluded prior to the invasion, those aluminum smelters with expiring energy contracts or spot contracts have experienced extreme price pressures. The latter has directly contributed to the curtailment, idling, and shutdown of primary aluminum smelters and other energy-intensive industries in higher marginal cost areas, such as the United States and Western Europe.

Due to the disruption in energy markets and, by extension, the aluminum production base following Russia’s invasion of Ukraine, DoD believes that the domestic HPA industry cannot reasonably be expected to provide the capability necessary for HPA production.

(a)(5)(C) –DPA Title III Action is the Most Cost Effective, Expedient, and Practical Alternative

In general, the re-start and commissioning of an aluminum smelter, using traditional electrolysis production technology, is a highly capital-intensive undertaking — like most greenfield projects for strategic and critical materials. For example, industry sources have cited the re-start cost for the Intalco Smelter (Ferndale, WA) at approximately \$175M. Cost estimates to re-start the Hawesville HPA Smelter (Hawesville, KY) have not been released publicly [REDACTED]

Prior to recent supplemental appropriations, these re-start costs have exceeded the funds available to the DPA Title III program. Even if such funds were available, private sector sources of capital typically have provided sufficient funds to support such re-start and commissioning activities. For example, the Hawesville HPA Smelter idled HPA operations in 2015, and following the implementation Section 232 tariffs, the Hawesville HPA Smelter secured private sector capital for its re-start in 2018.

On the other hand, the U.S. industrial base has developed alternative processing technologies for the production of HPA, which do not have the same up-front capital cost and recurring operating expenditure requirements of traditional aluminum smelting. These alternative technologies are proven at commercial scale and already are in production; however, industry has not expanded production [REDACTED]

## *Title VII – General Provisions*

Title VII of the Defense Production Act allows for the development of voluntary agreements and a reserve of Federal employees, among other authorities. The authority for voluntary agreements allows the Federal Trade Commission and the Attorney General waive civil and criminal anti-trust laws to enable industry to collaborate on plans of action to prepare for a national emergency. Similarly, the latter civilian reserve program allows Executive Branch agencies create a cadre of non-Federal employees who may be called into Federal service for the purpose of responding to a national emergency.

Neither of these authorities is applicable to the expansion of domestic aluminum production.

## **Conclusion**

The Defense Production Act (DPA) provides broad authority to the President to ensure the availability of domestic sources to meet U.S. defense, essential civilian, and homeland security requirements.

DoD currently uses DPA Title I authority to ensure that defense contracts receive priority access to aluminum products, and DPA Title VII authority is not immediately applicable to the expansion of domestic aluminum production.

With respect to DPA Title III, the DoD believes that high purity aluminum (HPA) is critical to national defense, and due to the disruption to energy market, domestic industry is unlikely to maintain or sustain sufficient HPA productive capacity without DPA support. In addition, the domestic industrial base has developed and deployed unique HPA production technologies that provide a more cost-effective, expedient, and practical approach to ensuring domestic HPA supply. [REDACTED]