**Required content of Working Paper CLIO-INFRA**

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1. Title

 Lead mining production by decade and country

2. Author(s)

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3. Production date

 2014-11-1.

4. Version

 1

5. Variable group(s)

 Environmental sustainability

6. Variable(s)

 Lead mine production, in metric tons

7. Unit of analysis

 Country

8. Keywords (5)

 Lead

9. Abstract (200 words)

Lead is a very corrosion-resistant, dense, ductile, and malleable blue-gray metal that has been used for at least 5,000 years.   Early uses of lead included building materials, pigments for glazing ceramics, and pipes for transporting water.   The castles and cathedrals of Europe contain considerable quantities of lead in decorative fixtures, roofs, pipes, and windows.   Prior to the early 1900s, uses of lead in the United States were primarily for ammunition, brass, burial vault liners, ceramic glazes, leaded glass and crystal, paints or other protective coatings, pewter, and water lines and pipes.   The advent of the electrical age and communications, which were accelerated by technological developments in World War I, resulted in the addition of bearing metals, cable covering, caulking lead, solders, and type metal to the list of lead uses.   With the growth in production of public and private motorized vehicles and the associated use of starting-lighting-ignition (SLI) lead-acid storage batteries and terne metal for gas tanks after World War I, demand for lead increased.   Most of these uses for lead continued to increase with the growth in population and the national economy.   Contributing to the increase in demand for lead was the use of lead as radiation shielding in medical analysis and video display equipment and as an additive in gasoline.

By the mid-1980s, a significant shift in lead end-use patterns had taken place.   Much of this shift was a result of the U.S. lead consumers compliance with environmental regulations that significantly reduced or eliminated the use of lead in nonbattery products, including gasoline, paints, solders, and water systems.   More recently, as the use of lead in nonbattery products has continued to decline, the demand for lead in SLI-type batteries has continued to grow.   In addition, the demand for lead in non-SLI battery applications also has continued to grow.   Non-SLI battery applications include motive sources of power for industrial forklifts, airport ground equipment, mining equipment, and a variety of nonroad utility vehicles, as well as stationary sources of power in uninterruptible electric power systems for hospitals, computer and telecommunications networks, and load-leveling equipment for electric utility companies.   By the early 2000s, the total demand for lead in all types of lead-acid storage batteries represented 88% of apparent U.S. lead consumption.   Other significant uses included ammunition (3%), oxides in glass and ceramics (3%), casting metals (2%), and sheet lead (1%).   The remainder was consumed in solders, bearing metals, brass and bronze billets, covering for cable, caulking lead, and extruded products.

10. Time period

 1705 -2012

11. Geographical coverage

 Worldwide

12. Methodologies used for data collection and processing

Data inventory

13. Data quality

 Good

14. Date of collection

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15. Data collectors

 [U.S.](http://www.doi.gov/) Bureau of Mines, [U.S. Geological Survey](http://www.usgs.gov/) (USGS).

16. Sources

Metallgesellschaft (1991) *Metallstatistik 1980-1990*. Druckerei C. Adelmann, Frankfurt am Main.

Schmitz, C.J. (1979) *World non-ferrous metal production and prices, 1700 - 1976*. Frank Cass, London.

USBM (1985) Mineral Commodity Report. In. U.S. Bureau of Mines, USA.

USGS (2009) Mineral commodities. In. U.S. Geological Survey, in Kelly, T.D., and Matos, G.R., comps., Historical statistics for mineral and material commodities in the United States: U.S. Geological Survey Data Series 140, available online at <http://pubs.usgs.gov/ds/2005/140/>. .