

**Nippon Mining & Metals Co., Ltd. (“NMM”) starts operation of demonstrative scale plant in development of technology to extract metals from used lithium-ion batteries and recycled cathode materials in the lithium-ion batteries; targeted to shift to commercial scale operation in 2011**

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NMM is scheduled to start operating its demonstrative scale plant aimed at development of technology to extract value-bearing metals such as cobalt, nickel, lithium and manganese (“metals”) from used lithium-ion batteries and recycled cathode materials used in the lithium-ion batteries (“used batteries”).

NMM aims to launch into commercial scale operation after completion of the pilot development of the world’s first technology to extract lithium and manganese from the used batteries in 2011.

Lithium-ion batteries have been widely used for electronic gadgets including mobile phones and personal computers. Furthermore, sharp increase in demand for the lithium-ion batteries used as power sources for the next generation vehicles such as hybrid or electric cars is expected, as these cars are expected to be widely used in the future low-carbon society. Meanwhile, all supply of lithium metal in Japan depends solely on imports from abroad, while the reserves of the metal are unevenly distributed in the earth, and the amount of mined ore of the metal is limited. Under these circumstances, establishing a technology to extract the metal from used batteries has been urgently required.

NMM has been engaged in building a technology to efficiently extract the metals from the used batteries applying its own skills and expertise developed and nurtured in the operation of smelting and refining of non-ferrous metals and recycling and environmental service activities. NMM was lately commissioned by the Ministry of Economy, Trade and Industry to develop technology to recover rare metals from the used lithium-ion batteries as a part of the Ministry’s industrial technology development program which was publicly invited. This developmental operation will be carried out in collaboration with Waseda University and Nagoya University, at a pilot plant to be built in the premises of NMM’s subsidiary company – Nikko Tsuruga Recycle Co., Ltd.

Additionally, NMM plans to increase its production capacity of cathode materials used for automotive lithium-ion batteries at its Isohara Works located in Kitaibaraki City, Ibaraki Prefecture. NMM will supply the metals extracted from used batteries to the Works and other manufacturers.

NMM is geared to contribute to establishing a recycling-oriented society by commercializing the technology through this pilot development.

## Outline of the pilot plant:

### 1. Location:

In the premises of Nikko Tsuruga Recycle Co., Ltd.,  
1 Wakaizumi-cho, Tsuruga-shi, Fukui 914-0027, Japan

### 2. Major facilities:

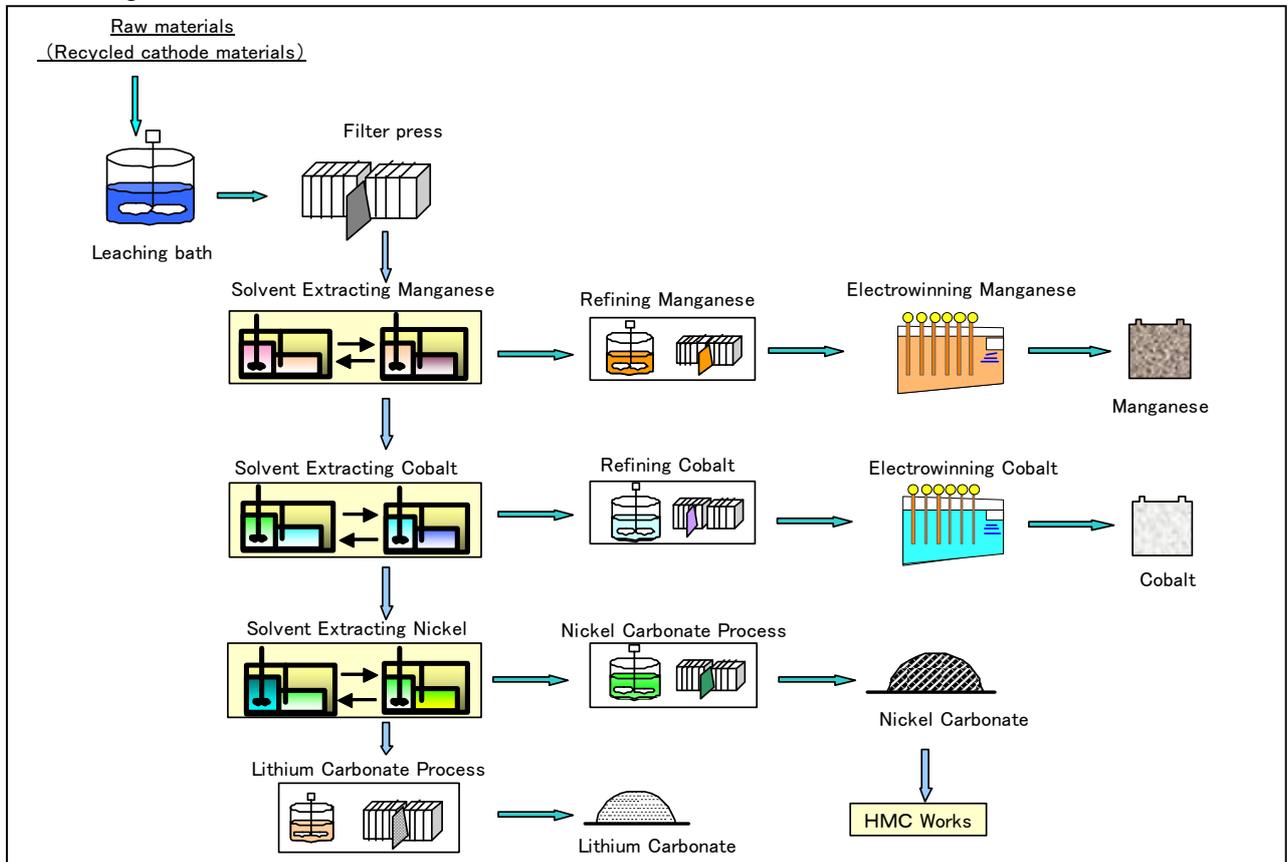
Pre-treatment and leaching facilities/equipment, Solvent extraction facilities/equipment, Refining facilities/equipment, Building and others.

### 3. Expected amount of extracted metals

Nickel: 6 tons/month, Cobalt: 10 tons/month,

Manganese: 6 tons/month, Lithium carbonate: 10 tons/month

### 4. Extracting Process form used batteries



### 5. Rendering of the pilot plant

