

# **The Alumina Technology Roadmap - An Update on Progress**

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## **Up to the Roadmap Workshop**

- Technology Roadmap Concept
- Alumina Technology Roadmap Workshop
- Alumina Technology Roadmap Strategic Goals
- Roadmap Workshop Outcomes/Themes

## **Since the Roadmap Workshop**

### Focus of this presentation

- Outcomes of 2 Implementation Committee meetings
- Summary of Questionnaire to the industry
- Next meetings
- Summary - For the Alumina Industry

# Technology Roadmap Concept

- An industry develops a vision of its future (business-based). The technology roadmap is the technology path to achieve that vision.
- It is a goal-based research and development agenda.
- Generally, it is pre-competitive collaborative partnerships between companies, research organisations, government agencies and where applicable, suppliers.
- This methodology has been used extensively by the US Department of Energy, Office of Industrial Technologies (DOE/OIT) for a number of energy-intensive industries - very successfully used by the aluminium industry.

# Alumina Technology Roadmap Workshop

- Steering Committee formed - March 2001
- Strategic Goals issued - April 2001
- Workshop was held in Fremantle, Western Australia in May 2001
- Participants were senior alumina industry people, researchers, government and industry associations (both US and Australian)
- Workshop was coordinated by AMIRA International, the minerals industry research association
- The workshop process was facilitated by Energetics Inc., USA

# Strategic Goals - 2020

- Reducing operating costs of existing plants by 3% per annum
- Improve energy efficiency - reduce energy consumption to 25% below current bauxite- specific best practice
- Capital costs of new plants at <US\$500/annual tonne. Major expansion at <US\$350/at, before tax ROI >18%
- Contribute to improvement of overall performance on environment, health and safety to world's best practice and consistent with global sustainable development principles
- Produce a product that meets all of our customers' current and future needs

# Roadmap Workshop Outcomes/Themes

## Major Roadmap Themes

- Bayer Process chemistry and alternatives
- Resource utilisation
- Energy efficiency
- Process Knowledge and management
- Residue treatment and re-use
- Safety/Human exposure

The 12 Highest priority technology needs were identified by the participants. Also identified were:

- R&D response to these needs
- Technical and economic risk
- Potential pay off
- Potential impacts of the technology

# Since the Roadmap Workshop

November 2001 “Alumina Technology Roadmap” booklet published

15 November - 1st Alumina Technology Implementation Committee meeting teleconference held

- Two sessions because of time zones
  - Australia, USA & India / Europe

## Actions

- Committee members to “sell” the Roadmap concept to their senior executives
- A questionnaire to be sent out to:
  - prioritise R&D needs
  - seek feedback on optimal representation and specific projects implementation process

# Summary of Questionnaire

Of the 12 highest R&D priorities areas:

Priority

1. Almost all saw as important:

- |   |   |
|---|---|
| 1.2 Scale management                          | 3 |
| 1.3 Technical solutions for refinery releases | 2 |
| 2.5 + 3.1 Impurity removal                    | 1 |

2. Rated high by some and low by others:

- |  |   |
|--|---|
| 2.1 Alternative methods to accelerate precipitation rates          | 4 |
| 2.1 Bauxite residue - cost effective inerting and alternative uses | 5 |
| 2.3 Conversion of monohydrate bauxite to a more beneficial state   |   |
| 2.4 Major reduction in caustic consumption                         |   |
| 2.5 Impurity removal: bauxite and bauxite beneficiation            |   |

3. Some interest:

- 3.1 Impurity removal: Bayer liquor
- 3.2 Knowledge management & best practice benchmarking
- 3.3 Waste heat recovery

4. Little interest

- 4.1 Direct reduction of bauxite or other aluminium materials
- 4.2 Full automation/improved control strategies

# Second Meeting Outcomes

held on 7 February 2002 - Videoconference Perth - London

## 1. Role of the Steering Committee

- Concept of a Board was discussed
- Recommendation is that a flat structure be adopted - no Board
- Overviews which projects are in the best interests of the industry and review progress
- Ensures that the Roadmap Vision is followed & maintains a business overview
- Nominates and provides an industry representative for each specific project
- Sets goals for each project & is the sponsor for all projects

## 2. Composition of Committee

- Industry Representatives (9) - Alcan, Alcoa, Aluminium Pechiney, BHP Billiton, Comalco, Glencore, Hindalco, Hydro, Kaiser
- Industry Bodies (2) - Australian Aluminium Council; Aluminum Association Inc.
- Facilitator - AMIRA International

# Second Meeting Outcomes cont...

held on 7 February 2002 - Videoconference Perth - London

## 3. Project Management and Composition

- Each project/research topic to be managed using Project Management methodology
- Each project to have a Research Leader (RL) and a specific Industry Representative (IR)
- Projects are managed jointly by the IR and RL
- Industry Representative is the overall project leader - has good project management skills and reports to the Steering Committee on progress. IR's time and costs will be borne by the specific project
- Project Team may include representation from vendors and consultants as well as the researcher (universities and other institutions)
- Research Leader will coordinate all research activities and ensure that the research direction is maintained according to the Mission given by the Steering Committee

# Second Meeting Outcomes cont...

held on 7 February 2002 - Videoconference Perth - London

## 4. Project Selection and Definition Mechanism

As a prototype - AMIRA (T Bagshaw) to work with industry to develop a template using Scale Management as project area - To be completed by end of March

Endorsement of template - By mid-April

Other templates to be developed:

Refinery releases - Leadership role = Alcoa

Impurity removal - Leadership role = BHP Billiton/Worsley

Accelerated Precipitation - Leadership role = Glencore/Auginish

Bauxite residue - Leadership role = Hydro

Each leadership role company to enlist the input of 1 or 2 industry “experts” in that specific area

Teleconference on progress - To be held in early June

## **Next Meetings**

Implementation Committee face-to-face meeting will be at the Alumina Quality Workshop, 8-13 September 2002 at Brisbane, Australia.

Other Meetings: Two per year by video conference

## **Funding - Aluminum Industry Model**

Since 1996 in the US DOE-OIT working with the USA Aluminum Association Inc. has been able to facilitate the introduction of major improvement programs through the utilisation of the roadmap process

- 35 cost-shared projects with 80 technology partners
- total expenditure of over US\$70 M

# Summary - For the Alumina Industry:

- The technology development centre is Australia.  
Is it possible to get similar Australian Government support through the Light Metals Action Agenda initiative?
- The alumina industry is still “fragmented” and not effectively using benchmarking techniques nor is it presenting a truly coherent voice to Government.
- Alumina industry’s technical leadership needs to be more pro-active in getting the industry’s CEO attention through more formal longer term technology planning.
- Utilising the Roadmap process will present to Government, Researchers, Vendors & others an industry view of its longer term technology needs.

Will this Roadmap Process make a difference to the rate of technology development for the alumina industry?