ALUMINIUM FOR 2010

Business Drivers	Issues	Technology & Innovation need	Key
Market Competitiveness	1. Reduce production costs	Improve further the Hall-Heroult process [28]	A
		To develop Roll-Casters to make 5,000 series alloys [25, 26]	B
		To increase productivity of extrusion presses including those used for strong alloys (2,000, 7,000, 5,000 & 8,000) [24, 25]	
		Further develop "Near Net Shape" processes, ie. High performance casting, hot and cold forging and thixo forging and be able to recommend best process for particular applications [26, 27]	C
	2. Further reduce the amount of aluminium used in particular existing end products and ensure minimum use in new areas.	Be able to influence design of products and by working with users ensure that customers get what they "need" rather than what they "want" [5, 6, 7, 8]	
	3. Ensure that potential users know about aluminium (ie. properties, advantages, limitations)	Use best "teaching" methods available to put messages over to schools, universities, manufacturers, specification authorities and government [33]	
	4. Need to be aware of new developments in competitor materials, ie. Steel, cast iron, magnesium, titanium, plastics and CFRP in order to identify new targets to be met to meet the competition.	Ensure that the industry has the R&D capacity, production and marketing personnel and have adequate training facilities.	D
		Maintain and extend good working arrangements with Universities [10]	E

	5. Seek price stability	Increase number of long term legal contracts with customers [5, 34]	
Likely Changing "Customer Attitudes"	1. For all transport applications legislation against excessive use of fuel and a demand for lower emissions will increase.	Prove that aluminium can meet these demands by its use to a greater extent than hitherto in automobiles, trains, ships and commercial vehicles resulting in lighter, safe products at acceptance costs [10, 11, 12, 13, 14, 15]	(F)
	2. Refurbishing of buildings will be seen to be cheaper than the replacement.	Ensure that painting and anodising of extrusions and sheet are developed to meet changing needs of specifiers, architects, local authorities and owners of buildings. Extend use of "systems" to meet needs [18]	
	3. In packaging the demand for "smart" packages, combination of aluminium with plastics, more attractive shaped cans will increase. The easy opening feature proven for beverage cans could be required, with some development, for a wide range of products previously contained in tin plate or steel cans.	Work with suppliers to combine their input to the problem with that of the aluminium industry but remember that the aluminium beverage can was an aluminium industry innovation [20, 21, 22, 23]	G
Material Sustainability	1. Aluminium Recycling is well established in most end use areas but improvements can be made to further both the technology and the image.	Work with users to ensure "design for recycling"	H
		Establish, on a sound economic basis, sorting methods which are now technically available (eg. Lasers) to identify alloys to allow closed circuit recycling: this applies in particular to the automobile	
		Improve the methods for collecting foil and for dealing with foil used with other materials	

		Make the many important advantages proven for aluminium recycling known and understood by government, users, local authorities and the public [30, 31, 32]	
Customer Needs and Safety Assurance	Better combinations of properties are required, eg.		
	1. Strength, corrosion resistance, toughness and joining ability for aerospace alloys [13, 14, 15]	Extend the existing extensive knowledge on factors in production, alloying, working and thermal treatments that influence properties. This work relies increasingly on the use of models together with experiment. It is essential therefore that reliable property data for use in the models is available and that agreement is obtained on the exact nature of this data.	I
	2. Forming, corrosion resistance and joining for automobiles, rail cars and ships [10, 11, 12, 13]	Work closely with users. Influence codes of practice and specifications.	
	3. Surface condition, response to finishing operations, extrusion, shape, complexity for building [16, 17, 18, 19]		J
	More design data required eg. Fatigue, corrosion performance, crash resistance [10]		
Environment Legislation and Concerns	1. 60% of aluminium produced in primary smelters involves the use of clean hydro-electric power. Any new smelters could, with benefit to the environment, employ water power but account must be taken of other ecological issues arising from provision of the water, eg. location of dams and effect on flora and fauna.	In particular for those smelters using electricity generated by fossil fuels, the reduction of power used in the electrolytic process will benefit the environment as well as reducing costs. Such reductions will not be easy to achieve and producers should consider co-operation to fund the necessary very expensive work.	K

	2. The industry has already greatly reduced emissions from both primary and secondary smelters and from semi-fabrication plants. Further requirements will in consequence be difficult (see also recycling) [28, 29]	Make legislators fully aware of the true value of aluminium by life cycle analysis and of the efforts already made by the industry to ensure "best ecological" practice.	L

Notes relating to Aluminium for 2010 Drivers -V- Technology and other Needs

The numbers against various items ( ) refer to pages in the Aluminium Federation Foresight Project report "Aluminium and Production and use in the UK in Building, Transport and Packaging, 2010 and Beyond", published November 2000.

(A) UK called for this work. US also, but they said that work on alternative processes should also be undertaken.

(B) It is claimed that Roll-Casters now exist which can produce both 5000 and 6000 alloys. Where is the evidence that the products can match those produced by conventional methods?

(C) Decline in shape casting production in UK must lead to questioning of value of continue work on the process. If such work does continue it should be viewed together with other Net Shape processes to ensure that targets are different, otherwise effort could be wasted.

(D) (E) I.G.T. aims to ensure these.

(F) Much progress with respect to automotive. More effort needed on sheet forming. Even more will be needed if (B) proceeds!

(G) The threat to aluminium cans unless changes are made seems unfounded. But is it? Failure in many cases of steel, easy-opening can ends for non-pressure containers should lead the aluminium industry to attempt to obtain that market. Failure to maintain the can market would be as serious as a failure to obtain that for the car!

(H) Find the means of making the public aware of the fact that aluminium foil is not 2silver paper" or "tin foil".

(I) Little or no progress in co-ordination of effort. Fewer aluminium companies now involved in the UK. Also, increases recognition that validation of models is needed without the people needed to do that.

(J) Few if any people available with the necessary background or "clout".

(K) Merging of Alcan Aluminium and Pechiney should help.

(L) So much already done, yet more demanded. Do those making the demands really understand the issues involved? Probably not.