



**MINUTES
GENERAL ASSEMBLY OF MEMBERS
INTERNATIONAL CADMIUM ASSOCIATION
Thursday, October 14, 2004 – 1:30 PM**

**The Royal Aeronautical Society
4 Hamilton Place, London W1J 7BQ United Kingdom**

1. CALL TO ORDER

The General Assembly of Members of the International Cadmium Association was called to order at 1:45 PM by its Vice-Chairman, Jonathan G. Helliwell of Johnson Matthey Specialty Coatings, in the absence of the Chairman, Marc von Schwerin of Noranda, Inc. The following persons were in attendance or were represented by their Proxy:

REPRESENTATIVE

Graham White
Jonathan G. Helliwell
Robert Eloy
Jill Ledger
Nelson Rodrigues

MEMBER COMPANY

Considar Metal Marketing, Inc.
Johnson Matthey Specialty Coatings
SAFT
SAFT
SLMC

MEMBERS' PROXIES

Michael Ball
Colin Thirlaway
Norman W. Gibson
Mitsuyoshi Iwasaka
Betsy Kraft-Liebermann
Marc von Schwerin
Norman England
Charles Monahan
Yves DuBois

MEMBER COMPANY

Acme Electric Corporation
Black & Decker Corporation
James M. Brown Ltd.
Japan Mining Industry Association
Kraft Chemical Company
Noranda, Inc.
Portable Rechargeable Battery Association
Panasonic Industrial Company
Umicore S.A.

STAFF AND GUESTS

Alejandro Fernandez
Andrew Green
Lidia Regoli
Hugh Morrow

ORGANIZATION

Met-Mex Penoles, S.A. de C.V.
ILZRO
International Cadmium Association
International Cadmium Association

Dr. Helliwell asked each attendee to introduce herself/himself and their affiliation, and circulated an attendance roster for each attendee to sign. The Vice-Chairman asked Hugh Morrow to serve as the Secretary Pro-Tempore for recording the Minutes of the General Assembly. Finally, Dr. Helliwell announced that the pigments interests of Johnson Matthey had been sold to Rockwood Pigments, Inc.

and that the Johnson Matthey membership in the International Cadmium Association would be transferred to Rockwood Pigments. Dr. Helliwell indicated that he would step down as Vice Chairman and a Director of ICdA and be replaced by Dr. Damian Thomas of Rockwood Pigments(UK) Ltd.

The Vice Chairman then asked Mr. Morrow if a Quorum of Members were present for the meeting. Mr. Morrow replied that a sufficient number were either present in person or represented by Proxy to constitute a quorum for the transaction of business.

2. APPROVAL OF THE MINUTES OF APRIL 22, 2004 GENERAL ASSEMBLY

Dr. Helliwell stated that the Minutes of the previous ICdA General Assembly of Members, held in Chapel Hill, North Carolina, USA on April 22, 2004, had previously been distributed to the membership for review and comment. He asked if there were any additions or corrections to these Minutes as distributed. None being forthcoming, Dr. Helliwell asked for a Motion to approve the Minutes of the April 22, 2004 General Assembly on Members. **Upon motion made by Robert Eloy, seconded by Nelson Rodrigues, and carried unanimously, the Minutes of the April 22, 2004 ICdA General Assembly of Members were approved as submitted.**

3. ELECTION OF OFFICERS AND DIRECTORS

Ms. Lidia Regoli presented the Proposed Slate of Officers and Directors of the International Cadmium Association, which is attached to these Minutes as Annex I. Mr. Graham White is proposed to serve as Chairman and has agreed to serve if elected. Robert Eloy and Damian Thomas, representing respectively the battery and pigments industries, are proposed to serve as Vice Chairmen. Mr. Marc von Schwerin of Noranda, Inc. and Mr. Lars-Goran Bjorkqvist of Boliden (formerly Outokumpu) will remain as Directors until the end of their company's membership in ICdA at the end of 2004. Mr. Steven Heddle of INMETCO is proposed to replace Mr. Kenneth L. Money as the Director from INMETCO due to management changes within INCO / INMETCO. Thus, the Board of Directors in 2005 will consist of 9 members, which is smaller than in recent years. However, it is felt that a smaller, more active Board of Directors will be more effective in running the activities of the association.

Dr. Helliwell asked if there were any additional proposals for Officers and Directors. None being forthcoming, he asked for a motion to approve the Proposed Slate of Officers and Directors. **Upon motion made by Robert Eloy, seconded by Nelson Rodrigues, and approved by the meeting, the Proposed Slate of Officers and Directors, as shown in Annex I, was adopted.**

4. FINANCIAL REPORT

Lidia Regoli presented the Financial Report. While it was originally anticipated that the balance brought forward at the beginning of 2004 would be \$80,000, this amount has now been slightly reduced to \$70,000. Against an originally forecast expenditure budget of \$275,300 in 2004, it is now estimated that costs for 2004 will be \$222,860. Expected revenue for 2004 was originally projected to be \$266,500, but is now anticipated will be \$251,000. It is therefore expected that at the end of 2004, a surplus for the year of \$28,140 will be realized rather than a loss of \$8,800. Therefore the amount carried forward at the end of 2004 should be \$98,140 which is \$27,000 higher than that originally anticipated at the end of 2003. The detailed figures for specific 2004 expenditure areas are shown in Table 2 on page 7 of the 2005 Business Plan which is attached to these Minutes as Annex II.

5. PROPOSED OPERATING PLAN AND BUDGET FOR 2005

Lidia Regoli presented the Proposed 2005 Business Plan for approval by the Members of the International Cadmium Association. The 2005 Business Plan is attached to these Minutes as Annex II. The Business Plan reiterated the recent changes in the structure and operation of the International Cadmium Association, stated its primary mission and objectives, detailed the current secretariat and staffing arrangements, and presented a detailed listing of the activities in which the association expects to be engaged in 2005 in Europe, North America and the International arena. Anticipated income for

2005 is \$219,000, down approximately \$32,000 because of the loss of the Noranda and Outokumpu memberships. It is estimated that total expenditures will be \$230,370, up about \$7,500 from 2004 levels. Total staff costs will be reduced due to decreased consultancy costs in North America but will be somewhat offset by increased headquarters staff time. Operational costs will be increased by about \$10,000 for communications efforts and allowance for contingencies. It is expected that a net loss of about \$11,370 will be realized during 2005 which will bring the reserve carried forward into 2006 down from \$98,140 to \$86,770. Further details of the specific regulatory activities and communications programs for 2005 are discussed in greater detail in subsequent sections below.

Jon Helliwell asked for further questions and discussions, and approval of the proposed budget for 2005. It was generally commented that the budget appeared to be in better shape than had been originally anticipated at the beginning of 2004, and that the prospects for 2005 did not appear as poor as they had one year ago. **Upon motion made by Nelson Rodrigues, seconded by Robert Eloy, and approved by the General Assembly, the proposed 2005 Business Plan for the International Cadmium Association was approved as presented in Annex II.**

6. ICdA OPERATIONAL MATTERS

Hugh Morrow discussed three operational matters which the International Cadmium Association is in the process of completing. These are amendments to the By-Laws of the association, the formal closure of The Cadmium Council, Inc. in the United States, and progress on the development of the new Members-Only website for the association. Presentation of these issues was outlined on four slides, copies of which are attached to these Minutes as Annex III.

6.1 Amendments to the By-Laws of International Cadmium Association – At its General Assembly of Members in October 1999, Raymond Sempels, then Executive Director of ICdA, presented a set of By-Laws, adapted largely from the existing By-Laws of the International Zinc Association, for consideration by the ICdA membership. These proposed By-Laws were subsequently approved at the April 2000 ICdA General Assembly of Members held in Toronto, Ontario, Canada. However, Lidia Regoli recently checked with the Belgian authorities on the status of the International Cadmium Association in Belgium and discovered that it was registered as a foreign (U.K.) corporation in Belgium and that its By-Laws, which were in French, were not the same as those approved in Toronto in April 2000. Ms. Regoli has taken legal advice to determine the steps necessary to register International Cadmium Association as a Belgian organization and not a foreign corporation, and to establish the By-Laws under which the association is operating. There is also the question of whether or not we wish to make any changes in our By-Laws to more accurately reflect the manner in which our activities are structured and conducted. Meanwhile, the By-Laws approved in April 2000 would continue to be used to guide ICdA operations.

6.2 Closure of The Cadmium Council, Inc. – Hugh Morrow detailed the steps which have been taken since the last General Assembly of Members to complete the formal closure of The Cadmium Council, Inc. After the last General Assembly on April 22, 2004, a formal petition entitled “Action of the Board of Directors Taken By Written Consent in Lieu of a Meeting” was circulated amongst the Officers and Directors of the International Cadmium Association registered with the Commonwealth of Virginia. This petition has been signed by all listed Officers and Directors.

Next a document entitled “Unanimous Consent of the Members of Cadmium Council Incorporated” was circulated to all Official Members of the International Cadmium Association who became ICdA members through their original members in The Cadmium Council, Inc. As of October 14, all organizations listed except four had signed the Unanimous Consent petition, and since October 14th, two more have signed, leaving only two companies yet to sign – Industrial Minera Mexico, S.A. de C.V. and MarathonNorco Aerospace, Inc. The attorneys for the International Cadmium Association in North America, King & Spalding, are now seeking those final two signatures.

Finally, Mr. Morrow has notified the Virginia Employment Commission that The Cadmium Council, Inc. is in the process of dissolution, and that it no longer retains employees as of January 1, 2004. This effectively means that ICdA / CCI will no longer be required to file an Annual Report with the Commonwealth of Virginia nor to pay a \$25.00 annual registration fee.

6.3 ICdA Members-Only Website - Mr. Morrow described the progress made in developing a new website with progress reports, reference information, and the most recent status of regulatory issues on line. The latest Progress Report is shown on the right hand side of the screen, while links to further information are listed on the left hand side. For example, links in the Legislature section will take members directly to copies of current legislation on batteries, pigments, coatings, waste and other subjects. Links to Regulatory Affairs, General Assemblies, Review Articles, and supply/demand market information are also included. There are already approximately 30 documents on the website and more being added constantly. At present, the website may be accessed at www.icdamembers.org with a user name of **icda** (lower case) and a password of **cadmium** (lower case). In the future, individual user names and passwords will be assigned to individual ICdA members.

7. FORMATION OF RECHARGE

Jill Ledger, Corporate Communications and Institutional Relations Director for SAFT, made a presentation on the expansion of *CollectNiCad* into an organization which will now advocate and promote the management, collection and recycling of all portable rechargeable battery chemistries throughout their entire life cycle from raw materials through final disposal. The new organization will be called "RECHARGE" and will be headquartered in Brussels, Belgium. The sponsoring member companies include the battery manufacturers – Sanyo, SAFT, Hoppecke and Uniross; the original equipment manufacturers – Black & Decker, Robert Bosch, Thomas & Betts and Cooper Menvier; metals industry organizations – INCO, Falconbridge, International Cadmium Association, and Nickel Institute; and the battery recyclers – Accurec, INMETCO and SNAM. Ms. Ledger's presentation is attached to these Minutes as Annex IV.

8. UPDATE ON CADMIUM REGULATORY ISSUES

8.1 European Union Regulatory Issues – Lidia Regoli presented an overview on the major European Union regulatory issues affecting cadmium, a copy of which is attached to these Minutes as Annex V. These included:

- An update on the outcome of the EU cadmium risk assessments at the level of the CSTEE and the OECD. An overview of the remaining issues was also given, including the status of the conclusion i) works on cadmium bioavailability in sediments and on softwaters, as well as the Rapporteur's official request for an update of information on production volumes and emissions prior to developing risk reduction strategies.
- A review of the battery directive. It was made clear at the meeting that the battery directive is now a political discussion and must be fought politically. Practical aspects influenced by this directive need to be emphasized such as impact on jobs, economy, internal harmonization, etc. Furthermore, it was mentioned that there are some fundamental misunderstandings by regulators and the public about how batteries are sold and returned for recycling.
- A review of the RoHS Directive. ICdA's recent request for adding an additional exemption for cadmium pigments was also mentioned.
- A review of the Water Framework Directive. Some clarifications were made on the implications of the implementation of this Directive on industry's emissions in the future.

8.2 Focused Activities for Cadmium Pigments -

A review of the focused actions taken with pigments producers was made. These included a first meeting in July 2004 where the issues and main challenges of the pigment producers were identified. A management group meeting followed in September, at which an action plan and priorities were identified. These activities were mainly focused on the challenges in Europe as they dominate the worldwide situation.

8.3 North American and International Regulatory Issues – Hugh Morrow presented a summary of North American and International regulatory issues, a copy of which is attached to these Minutes as Annex VI. The North American issues covered included the development of the U.S. EPA's Metals Assessment Framework to replace the Persistence, Bioavailable and Toxic (PBT) system previously used to evaluate metals; the California legislation banning the use of cadmium in cathode ray tubes, video screens and cellular telephones, similar to the EU's ROHS Directive; the National Toxicology

Program's (NTP) evaluation of the toxicology of cadmium telluride (CdTe); and the recent NAFTA report "Taking Stock" which evaluates dangers to children's health, reproductive toxicity and carcinogenicity based on the USA's Toxic Release Inventory (TRI) and Canada's National Pollutant Registry Index (NPRI) both of which include transfers as well as releases, thus over-reporting releases, and on the Environmental Defense Fund's "scorecard" of carcinogens, reproductive toxicants, developmental and neurotoxicants.

The international issues of concern focused mainly on a high level of current activity within the United Nations Economic Commission for Europe's (UNECE) Long-Range Transboundary Air Pollution (LRTAP) Protocol on Heavy Metals. Present activities are focused on development of a Task Group to revise the Heavy Metals Protocol, perhaps to include new metals and products, and to utilize the Critical Loads and Effects-Based approaches to establish heavy metals air deposition limits. The USA and Canada oppose this approach, but Germany and some of the Nordic nations favor it.

Work within the OECD on the NiCd battery collection and recycling program is stalled pending the outcome of the EU Battery Directive. Mr. Morrow also mentioned the new OECD Chemical Product Policy (CPP) which has been initiated by Japan and supported by Sweden to manage the impacts of chemicals throughout their entire life cycle.

The United Nations Environment Program (UNEP) has two programs of potential interest to the cadmium industry – the Heavy Metals Program which is thus far confined to mercury, and the Strategic Approach to Integrated Chemicals Management (SAICM) in which virtually all major international organizations are involved and which ICMM is following closely. Many view the SAICM program as one which might supplant most other international chemicals control programs.

Mr. Morrow reviewed the status of the World Health Organization's (WHO) Provisional Tolerable Weekly Intake (PTWI) value for cadmium which has been maintained at its current level during the most recent meeting in Rome in 2003 in spite of Nordic efforts to drastically lower it. Mr. Morrow also showed data to indicate that, in fact, daily cadmium intakes have been steadily decreasing over the past 30 years, and thus the safety margin between the PTWI and weekly intake values has been increasing and not decreasing as the Nordics have maintained.

Finally, Mr. Morrow reported on the G-8 3R's initiative taken apparently at the behest of Japan to encourage recycling, reuse and reduction of waste. One of the main issues, however, is apparently the reduction of barriers to the worldwide flow of goods and materials, and thus this initiative may in fact be one to eliminate some of the regulatory barriers to worldwide recycling which currently exist, for example, under the Basel Convention.

9. REVIEW OF COMMUNICATIONS NEEDS

Lidia Regoli reviewed the two most recent publications of the International Cadmium Association, both issued in 1998, and entitled "Cadmium – A Problem of the Past, A Solution for the Future" and "Cadmium Pigments Are Green." All agreed that these short summaries had generally been well received, but that perhaps an update of these publications was in order. Hugh Morrow also pointed out that it would be well to prepare short 2-page publications on the NiCd battery and coatings applications as well to serve those markets. Suggestions were made by the attendees that perhaps these summaries should be in electronic form and should be posted on our public website. Another suggestion was made that the basic four-page pamphlet could be included with individual two-page sheets on specific markets depending on the specific need. A provision of \$5,000 has been made in the 2005 budget to allow for the production initially of a revision of the four-page general brochure. In the meantime, Dr. Regoli will seek input from members on what specific communications they would like to see developed, and will establish cost estimates of the various methods of communications production.

10. UPDATE ON CADMIUM MARKET ISSUES

Hugh Morrow presented an overview of the present state and trends in the worldwide cadmium market which is attached to these Minutes as Annex VII. He noted that primary cadmium production is decreasing steadily, especially in Europe, but that secondary cadmium supply through NiCd battery

recycling is increasing in North America, Europe and Japan. Cadmium stocks now appear to have been exhausted, but some partially processed cadmium is being sent to China for further refinement and conversion into materials for NiCd battery production in China. The five largest cadmium producers in the world are Japan, China, Korea, Canada and Mexico.

On the consumption side, the cadmium market continues to be dominated (81%) by nickel-cadmium batteries and China and Japan are by far the world's largest producers of NiCd batteries. After a marked drop in NiCd battery production between 2000 and 2001, both Japanese and Chinese NiCd battery production increased for the next three years. NiCd batteries are sold mostly into power tool, cordless telephone and household applications, but with also strong applications in emergency lighting and portable audio/visual applications. Industrial NiCd batteries, which account for only about 20% of the cadmium used in all NiCds, are dependent mainly upon aircraft, railway and uninterrupted power supply applications. However, growth is expected in the Hybrid Electric Vehicle (HEV) market and some HEVs may be powered by NiCds. The world's largest NiCd battery producers are Sanyo, BYD in China, Panasonic and SAFT.

The *Metal Bulletin* published price for cadmium has remained under \$1 per pound since the early 1990s. After increasing to about \$0.85 per pound for 99.99 purity grade material for much of 2003, the *Metal Bulletin* price decreased in the fall of 2003 but then increased again in the fall of 2004 back up to about \$0.85 per pound.

11. NEW BUSINESS

Dr. Helliwell raised the issue of the adverse press releases which had been circulating in recent months regarding cadmium contamination of rice crops in Thailand. Dr. Regoli responded that ICdA had been following this issue closely but that the company which now has controlling interest in the original Thai smelter from which the problem arose prefers to handle any publicity regarding this situation on their own. Therefore, it is not expected that the International Cadmium Association will make any public comments on this issue.

12. NEXT MEETING DATE

The next General Assembly of Members of the International Cadmium Association will tentatively be held on Thursday, March 3, 2005 at the American Zinc Association's annual conference in Nevada, USA. All ICdA members will be notified of the details of the AZA meeting and the exact time and place of the ICdA General Assembly once it has been established.

13. ADJOURNMENT

There being no further business before the General Assembly of Members and upon motion duly made by Graham White, seconded by Robert Eloy, and approved by the meeting, the General Assembly of Members of the International Cadmium Association was adjourned by its Vice Chairman, Dr. Jon Helliwell, at 5:10 PM.

Respectfully Submitted,

Hugh Morrow
Secretary, Pro-Tempore

Approved,

Dr. Jonathan G. Helliwell
Vice Chairman



ANNEX I

PROPOSED OFFICERS AND DIRECTORS INTERNATIONAL CADMIUM ASSOCIATION

The following persons are proposed for election or re-election as Officers and Directors of the International Cadmium Association for a three-year term at its General Assembly of Members to be held on October 14, 2004:

Chairman	Graham White	Considar Metal Marketing, Inc.
Vice Chairman	Robert Eloy	SAFT
Vice Chairman	Damian Thomas ¹	Rockwood Pigments (UK) Ltd.
Director	Murray E. Cook	International Zinc Association
Director	Yves Dubois	Umicore S.A.
Director	Mitsunori Takao	Sanyo Electric Co., Ltd.
Director	Timothy G. Pugh	Black & Decker Corporation
Director	Steven Heddle	INMETCO
Director	Jacques David	S.N.A.M.
Director	Marc von Schwerin ²	Noranda, Inc.
Director	Lars-Goran Bjorkqvist ²	New Boliden ³

* * * * *

¹ Damian Thomas of Rockwood Pigments (UK) Ltd. replaces Jonathan G. Helliwell as both Director and Vice Chairman

² Messrs. Von Schwerin and Bjorkqvist remain as Directors until the end of their company's membership in ICdA at the end of 2004

³ Formerly Outokumpu



International Cadmium Association

2005 BUSINESS PLAN

Submitted to the approval of the Members
Of the International Cadmium Association

1 October 2004

1 Introduction

The International Cadmium Association has represented the interests of the producers and users of the metal since its formation in 1993, with the amalgamation of the UK-based Cadmium Association and the US-based Cadmium Council Inc. The organisation has strong practical and financial support from a broad range of cadmium-related industries.

Following a strategic review of the organization's structure by ICdA's Board of Directors, ICdA has now stabilized its financial structure through the support of IZA and benefits from synergies in operation of ICdA and IZA. Nevertheless, the organization operates on a reduced budget over previous years and activities are inevitably constrained by resources.

This Business Plan sets out the operational and financial plans for ICdA in 2005.

2 Mission and Objectives

ICdA's mission is:

- Monitor scientific and regulatory developments that impact members' cadmium-related activities
- Respond to regulatory proposals and advocate the interests of members
- Report on scientific and regulatory developments to members

ICdA's primary objectives are to ensure market access for cadmium products and to respect the principles of sustainable development, including the protection of human health and the environment.

3 ICdA Secretariat and Staff

IZA provide secretariat services, including staffing, for ICdA. These staffing resources are structured differently to previous years, in line with budget constraints. Activities will largely be executed by two part-time principal staff members. The use of outsourced technical and administrative support and synergies with IZA is anticipated to significantly enhance operating effectiveness in the core activity of regulatory affairs.

An overview chart of the staffing structure, sources of external support, and synergies are available on the intranet.

Principal ICdA officers are shown in Table 1.

Table 1: ICdA Staff 2005

<p>General Manager (Dr. Lidia Regoli)</p>	<p><i>Location:</i> Brussels, Belgium <i>Responsibilities:</i> Association management and control; EU regulatory affairs <i>Reports to:</i> ICdA Chairman <i>Min Activity level:</i> 0.6 man-year</p>
<p>Senior Consultant (Mr Hugh Morrow)</p>	<p><i>Location:</i> Washington DC, USA <i>Responsibilities:</i> North American regulatory affairs; specific international regulatory affairs <i>Reports to:</i> General Manager <i>Min Activity level:</i> 0.5 man-year</p>

These staffing arrangements are flexible and higher levels of staffing can be applied dependent on ICdA requirements and available funding.

Given the extensive list of issues rising in European regulation, i.e.

- entering into the risk reduction strategy phase of the risk assessment under Council Regulation 793/93
- identified regulatory activities related to the pigments markets
- revision of the EU battery directive

it is proposed that a small increase in the staffing time of the General Manager for 2005.

3.1 Accounting and Administrative / secretarial support

ICdA does not employ any support staff. Administrative and secretarial support for ICdA's HQ will be drawn from IZA staff or otherwise outsourced. IZA will be reimbursed for costs incurred in providing this support. Accounting will be administered through IZA's internal systems, with ICdA retaining its separate bank accounts and audited annual accounts.

Office accommodation, office services, computing services and other support services will be provided by IZA.

3.2 Scientific Support

Expert support for regulatory affairs activities will be drawn, as required, from IZA's related organisations, in particular ILZRO.. Support may also be drawn from other individuals/organisations as required. These organisations will be reimbursed for costs incurred in providing this support.

4 2005 Activities

Activities in 2005 will focus on:

- Regulatory developments with impact on members' activities
- Communications strategy and activities

4.1 Regulatory Developments

4.1.1 European Union

Priorities:

- Cadmium Risk Assessment conducted under Regulation 793/93 and subsequent risk management procedures.
- Revisions to the Directive 91/157/EEC (The Battery Directive) – supporting actions to the European portable rechargeable battery association (RECHARGE)
- Specific issues related to pigments have been identified such as
 - o exemptions to Directive 2002/95/EC (RoHS/WEEE),
 - o monitoring of Directive 91/338/EEC (Restrictions on marketing and use of cadmium pigments, stabilizers and coatings)
 - o strategy and activities related to risk management.
 - o Other identified product specific regulatory threats
- Monitoring the revisions of the Classification and Labeling of cadmium and cadmium compounds for the 30th ATP (Adaptation to Technical Progress).

Monitoring level:

- EU directives for Groundwater, Soil Protection, Water Framework Directive, Waste, SCALE program (through Eurométaux)
- End-of-life Directives on Vehicles and other end of life directives, affecting certain cadmium products.

4.1.2 North America

Priorities:

- Activities in support of North American Metals Coalition on the U.S. EPA's Metals Assessment Framework for Metals
- Activities in support of North American Metals Coalition on the NAFTA CEC Sound Management of Chemicals Program
- Activities in support of the collection and recycling of cadmium containing products, particularly nickel-cadmium batteries

Monitoring level:

- Proposed regulations on occupational exposures, emissions and waste disposal of cadmium containing products
- Introduction of proposed Federal or local regulations to ban or limit cadmium products in North America based on EU Directives.
- Toxicological reviews on cadmium and cadmium compounds by the Agency for Toxic Substances & Disease Registry (ATSDR), the National Toxicology Program (NTP), the Integrated Risk Information System (IRIS) and other agencies.

4.1.3 International

Priorities:

- UNECE Long Range Transboundary Air Pollution (LRTAP) Heavy Metals Protocol including possible tighter emission limit values and restrictions on cadmium products
- WHO/FAO limits for dietary exposures to cadmium

Monitoring level:

- UNEP Heavy Metals Program and potential attempts to develop international binding agreements on cadmium
- The application of mandatory cadmium product recycling laws and EU-type restrictions on cadmium products in Asia, South America and Africa.

4.2 Internal Communications and Association Meetings

Briefings on regulatory developments and consultations with members on association strategy/actions are an important element of ICdA activity. A regular series of member communications will be maintained through 'Progress Reports'. Use of the pass-worded Intranet to ensure members have up-to-date access to information and positions will be an important part of this activity and will create a valuable archive for members' use.

Two general meetings of members (and Board meetings) will be held. These are envisaged to be held in March/April (North America) and October (London, England). Other meetings and conference calls will be held as required to address specific developments.

4.3 Communications activities

In 2004, it has become clear that there is a need to further integrate both general and sector-specific communications activities to support the regulatory affairs work and maintain confidence in markets. Activities related to both general and sector specific communications will be explored at the General Assembly in October 2004. Specific suggestions are to revise the existing communications information such as the pamphlet 'Problem of the Past, solution for the Future" and 'Pigments are Green', and to update the public website (www.cadmium.org) with the more recent developments.

4.4 Statistics and Market Information

A limited activity will be maintained to collate relevant statistical information on world cadmium production and use. This activity will be reduced over previous years and be focused on the information needs of regulatory and communications activities.

5 2005 Financial Plan

The 2005 financial plan is given in Table 2.

Table 2: International Cadmium Association 2005 Financial Plan (US\$)			
	<u>2004 Plan</u>	<u>2004 forecast</u>	<u>2005 Plan</u>
<u>STAFFING</u>			
Headquarters (A)	40.000	50.000	60.000
Senior Consultant (North America)(B)	107.500	101.760	88.320
Other Consultants(C)	35.000	4.000	0
Scientific Support	15.000	5.000	10.000
Secretarial	5.000	3.500	3.500
Administration/Accounting	6.000	11.000	11.000
Total Staff Costs	208.500	175.260	172.820
<u>OPERATIONS</u>			
Rent/rates/office services	14.000	11.000	11.000
Documentation, IT support	9.000	6.000	6.000
Insurances	1.500	1.500	1.500
Telecommunications	4.000	7.000	6.000
Postage	1.000	800	750
Meetings	10.000	4.000	5.000
Travel & subsistence	20.000	15.000	15.000

Recharge membership	2.300	2.300	2.300
Publications	0	0	5.000
Contingency (D)	5.000	0	5.000
Total Operating Costs	66.800	47.600	57.550
TOTAL COSTS	275.300	222.860	230.370
TOTAL PROJECTED SUBSCRIPTION INCOME	266.500	251.000	219.000
SURPLUS/(LOSS) FOR YEAR	(8.800)	28.140	(11.370)
SURPLUS/(LOSS) BROUGHT FORWARD	80.000	70.000	98.140
SURPLUS/(LOSS) CARRIED FORWARD	71.200	98.140	86.770

Notes to Table 2

- (A) 2004 forecast reflects higher than plan staff costs (plan preceded appointment); 2005 costs reflect increase in activity level.
- (B) 2004 costs included transition support to new general manager
- (C) 2004 costs were a provision for consultancy support during restructure
- (D) Contingency includes provision for doubtful debts

Rates of subscription for 2005 are unchanged over 2004 and are given in Appendix I.



ASSESSMENT SCHEDULE 2005

The assessable period for 2005 Membership dues is based upon the pounds of cadmium, expressed on a contained metal basis, mined, produced, recycled or consumed during the period, January 1, 2004 through December 31, 2004. The Board of Directors has set the following assessment rates (US \$ per pound of cadmium contained) for 2005:

<u>CLASSIFICATION</u>	<u>DUES BASIS</u>	<u>2005 DUES</u>
Cadmium Producers	Total Pounds of Cadmium Production	US\$ 0.025
	Minimum Assessment	US\$ 5,000
	Maximum Assessment	US\$50,000
Cadmium Recyclers	Total Pounds of Cadmium Production (excluding toll treatment)	US\$0.0125
	Minimum Assessment	US\$ 2,500
	Maximum Assessment	US\$25,000
Cadmium Oxide Producers	Total Pounds of Cadmium Contained In Cadmium Oxide Production (excluding Primary Metal Production reported above)	US\$0.00125
	Minimum Assessment	US\$ 2,500
	Maximum Assessment	US\$25,000
Cadmium Consumers	Total Pounds of Cadmium Consumption	US\$0.0025
	Minimum Assessment	US\$ 2,500
	Maximum Assessment	US\$25,000
Mining Companies	Total Pounds of Cadmium Mined (excluding Primary Metal Production reported above)	US\$0.0125
	Minimum Assessment	US\$ 2,500
	Maximum Assessment	US\$25,000
Associations, Distributors and Others	Flat Fee or Special Fundraisings	US\$ 1,500

Operational Matters

- **Amendments to the By-Laws of International Cadmium Assn**
- **Closure of Cadmium Council, Inc**
- **ICdA Members Only Website**

ICdA By-Laws

- **“By-Laws” Approved at General Assembly in Toronto – April 2000**
- **However, ICdA Registered as UK Corporation with Belgium**
- **By-Laws (French) of Belgium Different than Approved By-Laws**
- **Other Changes Needed?**

Closure of The Cadmium Council, Inc.

- **Action of the Board of Directors Taken by Written Consent in Lieu of a Meeting**
- **Unanimous Consent of the Members of The Cadmium Council, Inc.**
 - **Industrial Minera Mexico, S.A. de C.V.**
 - **MarathonNorco Aerospace, Inc.**
 - **National Association of Metal Finishers**
 - **Sanyo Energy (USA) Inc.**
- **Notification to Virginia Employment Commission of Dissolution Process**

ICdA Members Website

- **www.icdamembers.org**
- **User Name: icda (note lower case)**
- **Password: cadmium (lower case)**
- **Links to Regulatory, Market, Administrative Information**
- **Individual User Names and Passwords to be Assigned**



*The European Association for the Promotion
& Management of Portable Rechargeable Batteries
through their Life Cycle*

*« We are not making a union of countries,
but a link between people »
Jean Monnet*



- **Objective:**
 - promote the value of Portable Rechargeable Batteries (PRB)
 - promote collection & recycling of PRB
 - represent interests of all members of the battery life cycle manufacturers, assemblers, OEMs, distributors, collectors & recyclers
- **Establish common between**
 - all Portable Rechargeable Battery (PRB) technologies,
 - the entire chain of battery life: raw materials, manufacturing, end users, collection and recycling.

RECHARGE is an extension of CollectNiCad's scope of activities to all rechargeable battery technologies



Battery Manufacturers

Sanyo
Saft
Hoppecke
Uniross

OEMs

Black and Decker
Robert Bosch
Thomas & Betts
Cooper Menvier

Metals Industry

Inco
Inmetco
Falconbridge
ICdA
Nickel Institute

Recyclers

SNAM
Accurec



The program

Rechargeable & Recyclable

Registration and Collection

Regulation and Legislation

Information and Communication



Rechargeable & Recyclable

- ***PRB: value added product with distinct characteristics***
 - part of a fast growing market satisfying multiple demands
 - rechargeable => used many hundred times before disposal
 - used in durable goods => very long life-time
 - metals & chemicals that can be recycled
- ***RECHARGE promotes:***
 - recycling of all batteries collected separately
 - separate recycling of PRB once removed from WEEE
 - sorting and recycling of PRB from other collected batteries



Registration & Collection

- ***Fundamental principle: Shared responsibility***
 - assistance to National Collection & Recycling Organisations (NCROs) and interface with private ones (PCROs)
 - promote RECHARGE members' participation in N/PCROs
 - involve largest possible number of OEMs incorporating PRB in their equipment to engage in collection & recycling
 - mandatory Registration of all such OEMs to increase impact and deter free riders
 - Certificate of Good Practice for companies actively participating and supporting N/PCROs.



Regulation & Legislation

- ***Support EU and national policy-makers during legislative process & implementation stage:***
 - => ***Transposition in 25 Member States:***
 - WEEE Directive
 - future Battery Directive
 - => ***Other key activities:***
 - classification of Metals & Chemicals used in batteries
 - harmonisation of Materials Safety Data Sheets
 - Integrated Product Policy & life cycle analysis
 - Energy Efficiency standards
 - REACH



Information & Communication

- ***Promotion of PRB as a distinct, value-added product***
- ***Raise PRB industry's profile by:***
 - further developing & communicating arguments about PRB “Rechargeable & Recyclable” nature
 - compiling data about industry’s socio-economic weight & broader macro-economic contribution
 - communicating information about PRB technologies to relevant international bodies
- ***Liase with key stakeholders & decision-makers***
 - EU Parliament, Council of Ministers, Commission
 - Industry associations & NGOs



Thank you

*RECHARGE aisbl
Avenue de Tervueren, 168 B-3
B-1150 Brussels – Belgium
Tel. 00 32 2 777 05 67
Fax. 00 32 2 777 05 65*

www.rechargebatteries.org

recharge@rechargebatteries.org

EU RA on Cd/CdO and EU Directives London, 14 October 2004

Lidia Regoli
International Cadmium Association
168, Avenue de Tervueren, B-1150 Brussels, B



International Cadmium Association

EU Regulatory Affairs

- EU Risk Assessment at CSTEE and Way Forward
- EU Risk Assessment at OECD
- EU Directive on Batteries
- RoHS Directive
- Water Framework Directive

Cadmium EU RA at CSTE

- Human Health: CSTE Opinion received 28 Jan '04
 - ◆ Opinion impact on conclusions – MINOR
 - ◆ Criticism: analysis is not conservative enough
- Environment: CSTE Opinion received 4 June '04
 - ◆ Opinion impact on conclusions – MAJOR?
 - ◆ Criticism: analysis lacks integration of variability, and lacks clarity on the uncertainty in the assessment
- TRAR: CSTE Opinion received 4 June '04
 - ◆ Opinion impact on conclusions – MINOR
 - ◆ Criticism: lacks clarity on the level of conservatism
- Future process:
 - ◆ Rapporteur will compile opinions and issue « comments to the CSTE opinions on Cd files » by end of 2004?

Impact of the CSTE opinion on RA conclusions

- CSTE criticism and responses may alter the conclusions of the RA environment
- Responding to CSTE criticisms will:
 - ◆ improve the overall scientific robustness of risk assessments
 - ◆ provide better guidance for risk management
 - ◆ ensure continuation of the use of these RAs as the best scientific evidence of the impact of Cd to human health and environment in EU.

Way forward – Cd Human Health RA

- Risk management begins
 - ◆ Official request for data update from companies
 - ◆ Deadline end of 2004

- 2005: follow risk reduction strategy for risks identified to consumers and general population

Way forward – Cd Environment RA

- Rapporteur to revise the Cd RAR environment by 12/04
- Conclusion i) work
 - ◆ 1) Concl i) bioavailability in sediments is under way
 - ◆ 2) Concl i) softwaters is ???
- Additional testing requirements
 - ◆ PNEC sediment : additional ecotoxicity sediment ?
Depends on the outcome of the concli) sediments
- 2005:
 - ◆ Official request for data update by March 2005
 - ◆ Follow risk reduction strategy

Way forward – Targeted RA on NiCd

- Rapporteur to revise the Targeted RA on NiCd batteries by 12/04
- 2005:
 - ◆ Revision of the EU Battery Directive
 - ◆ Provide assistance to Recharge
 - ◆ Follow risk reduction strategy

Summary of Risk Conclusions in RAs

RA Human Health	RA Environment	TRAR NiCd Batteries
<p><u>WORKERS</u>: Concl (i) « on hold » for low dose-related neurobehavioural effects Concl (iii): at <u>reported</u> exposure levels, risk (inhalation), for acute tox, respiratory irritation, kidney bone repeated dose tox, Genotox, carcinogenicity, reprotox</p>	<p><u>LOCAL</u>: Concl (iii): water/sediment at 10 production and processing sites (stabilisers, pigments, plating, alloy). Local soil: 3 sites</p>	<p><u>LOCAL</u> NiCd Production/ Recycling plant: Concl (iii): to water for Cd recycler •Concl(iii) to sediments for all plants !</p>
<p><u>CONSUMERS</u>: Cd metal: risk for acute respiratory effects from Cd containing brazing sticks. Risk for dermal exposure from imported Cd containing jewelry</p>	<p><u>REGIONAL</u>: water: certain regions. soil: some regions e.g. UK. Waste water treatment plants: pigments, plating, alloys</p>	
<p><u>GENERAL POPULATION</u>: Concl (i) « on hold » for low dose-related neurobehavioural effects. Concl (iii) not excluded for kidney & bone (except adult non-smokers) lung (repeated dose tox, carcinogenicity/ genotox)</p>		

Request for Update to Exposure Data:

For December 31st 2004

- List of Names of manufacturers/importers liable to the provisions of Regulation 793/93/EEC
- Yearly Production, import and export data
- Site-specific exposure data related to Human Health

For March 15th 2005

- Site-specific exposure data related to Environment

EU Risk Assessment at OECD

- Belgium submitted RA to OECD on 26 January '04
- Advocacy paper was issued to OECD member states
 - ◆ Canada, USA, Australia, Japan, Korea
- Discussion at OECD meeting (SIAM) Paris, April 22
- Outcome is more transparency of effects data:
 - ◆ Human Health –critical value for workers
 - ◆ OECD: 5 µg/g creatinine
 - ◆ Europe: 2 µg/g creatinine
 - ◆ Environment
 - ◆ More clarity on how PNECs were derived
 - ◆ Lack of integration of bioavailability is mentioned
 - ◆ Down-tune the need for further testing for 'softwaters'

EU Directive on Batteries

Commission Proposal COM(2003)723 – November 2003:

- Aim: Prevent batteries being incinerated or landfill
- 90% recycling of collected portable batteries
- Producer responsibility for costs for collection, treatment and recycling for industrial & automotive batteries
- For portable batteries, the costs are to be shared with national authorities

Parliament's final report (Blockland report) - April 2004:

a radical shift away from Commission proposal

- Purpose of directive changed to « ban the use of heavy metals in batteries and accumulators »

EU Directive on Batteries

Council's draft report - September 2004:

Presidency is trying to sell this as a compromise

Substance Ban:

- Ban on all portable batteries with >20ppm of Cd by weight
- Phase-out of such batteries in cordless power tools in 4 years
- No ban on lead containing batteries

Collection Target:

- No specific NiCd collection target or MSW monitoring
- 30% by weight of average annual sales for portable NiCd
- Take-back of industrial batteries by the producer
- Aim at a closed loop for all batteries, prohibition of landfill/incineration of industrial and automotive batteries

Directive 2002/95/EC: RoHS

Restrictions of Hazardous Substances in Electronic equipment

Aim: « prevent the production of hazardous waste from electrical and electronic waste by restricting the use of Pb, Hg, Cd, and hexavalent Cr »

- Exemptions:
 - ◆ Cd in certain photocells, some anti-corrosion uses
- Concentration limits
 - ◆ « a maximum value of 0,01% by weight in homogenous materials for cadmium shall be tolerated
 - ◆ Refers only to impurities which are unintentionally introduced.

Water Framework Directive

(EC proposal ongoing since October 2000)

- Achieve 'good' quality status by 2010
 - Priority Hazardous Substances (PHS): Cd, Hg,..
 - Measures aimed at the cessation of discharges: « 0 » emissions by ~2026
 - Other listed metals : « near background » levels
 - Methodology of metal backgrounds
 - Task Force proposes setting EU wide default background values with possibility for MS to use local concentrations
 - Decision on 'added risk approach' to be taken in June
- Proposal expected to be issued by Autumn 2004
- Monitoring will begin in 2006

Cadmium Pigment Producers

- Expressed a need for focused activity to protect their market
- Meeting held on July 15th '04
 - ◆ Included 3 major EU producers (14 people)
 - ◆ Identified issues and main challenges
- Management Group met on September 6th '04
 - ◆ Identified action plan and priorities

Action Plan

- Improve RAR for pigments as basis for the 91/338/EC revision
- Follow Toys, WEEE, ect.. Directives
- Prepare politically and technically for 91/338/EC action

Groundwater Directive

(EC proposal now at Parliament)

EC Proposal:

- Overall purpose: introduce measures to prevent and control groundwater pollution by:
 - Assessment of good chemical status
 - Identification of sig. and sustained upward trends in the concentration of pollution.
- EU wide standards: not thought appropriate due to natural variability of groundwater composition.

Parliament: Schleicher draft report:

- Proposed list of EU wide standards (Cd: 1,0 µg/L,..)
- First EP reading in autumn 2004 (next parliament)

Thematic strategy for Soils

(EC proposal ongoing since April 2002)

- Policy will focus on the principles of prevention, precaution and anticipation. Main threats:
 - Erosion, organic matter decline, *local and diffuse soil contamination*, etc..
- Sources of soil contamination:
 - ◆ Historical contamination of production sites
 - ◆ Use of metal containing products in certain applications
- Legislation related to mining waste, sewage sludge, ect.. will be used as measures to prevent soil contamination
- Proposal expected to be issued by mid-2005

Air Quality Directive

(At Council)

- Environment Committee Vote on 20 April '04:
 - Agreement between the council and the parliament.
 - Formal adoption was made in June '04
 - Next step: translation into national law
- Target values will be established.
- Positive outcome: Directive makes reference to measures within proportionate costs and with consideration of BAT
- Cd (5 ng/m³), As (6ng/m³), Ni (20 ng/m³) by 2012

Directive 76/769

Restrictions on marketing and use of certain dangerous substances

Annex 1: 10th Amendment adds restrictions for Cd products



Directive 91/338: Cd in pigments, stabilizers and plating

- Planned regular review



1995 Review : Freeze from technical feasibility discussions



1999 Review: Directive 99/51

- 3 year extension of 'no change' based on WS Atkins conclusions
- Derogations granted: Sweden and Austria apply stricter restrictions
- Review of provisions on cadmium prior to 31 Dec '02 based on RA



2002: EU Court of Justice overrules National Cd restrictions

Regulatory Affairs Report North American and International Activities

**International Cadmium Association
General Assembly of Members**

**The Royal Aeronautical Society
4 Hamilton Place, London W1J 7BQ United Kingdom
October 14, 2004**

Major North American Cadmium Issues

-
- **U.S. EPA Development of Metals Assessment Framework to Replace PBT**
 - **NAFTA CEC SMOC Children's Health**
 - **California Cadmium Product Legislation**
 - Cathode Ray Tubes (September 2003)
 - Cellular Telephones (September 2004)
 - **National Toxicology Program on CdTe**

U.S. EPA Metals Assessment Framework

- **Originated as PBT Program on Metals in Late 1990s**
- **Strongly Opposed by North American Metals Council and Ad Hoc Metals Coalition**
- **All Nonferrous Metals Listed Under PBT Approach**
- **Metals Changed to WMPL (Pb, Cd, Hg) in 2002**
- **EPA Metals Action Plan in 2002/2003**
- **Independent Expert White Papers (October 2003)**
- **Metals Assessment Framework Developed**

U.S. EPA Metals Assessment Framework

- **Draft Framework Released on July 1st for Review and Comment**
- **Peer Consultation Workshop Held in Washington on July 27-28**
- **Nominees for Science Advisory Board (SAB) to Review Metals Assessment Framework**
- **Industry to Comment on SAB Nominees**
- **Framework Expected Completion in 2004**

U.S. EPA Metals Assessment Framework

- **Issue Papers**
 - **Environmental Chemistry of Metals**
 - **Human Health Effects of Metals**
 - **Metal Exposure Assessment**
 - **Ecological Effects of Metals**
 - **Bioavailability & Bioaccumulation of Metals**

NAFTA CEC Program on Children's Health

- **“Taking Stock” Report on Carcinogens, Developmental Toxicants & Neurotoxicants**
- **List Based on Environmental Defense Fund List of Suspected Neurological and Developmental Toxicants**
- **List Also Based on U.S. TRI & Canada NPRI**
- **Metals Listed Include Al, Ba, B, Co, Au, Fe, Ni, Se, Cu, Cd, Pb, Hg, Zn, “Metals”**
- **www.scorecard.org/chemical-profiles**

NAFTA CEC Program on Children's Health

- **NAMC Met with EPA to Voice Objections**
- **ICdA and Many Other Metals Associations Filed Comments in Opposition to Report**
- **United States and Canada also Objected to Many of the Conclusions and Statements**
- **Taking Stock Report to be Discussed at NAFTA CEC PRTR Meeting in Montreal on October 20-21, 2004**

California Legislation on Cadmium Products Electronic Waste Recycling Act

- **SB 20 Enacted into Law 9/24/2003**
- **Cathode Ray Tubes and Video Screens**
- **Requires Manufacturer to:**
 - **Collect a Recycling Fee after 11/1/2004**
 - **Establish Levels of Hg, Cd, Pb, Cr⁺⁶ in Products**
 - **Provide Information on Recycled Content**
 - **Specifies Compliance with EU ROHS Directive**
- **Amended by SB 50 on 9/29/2004**

California Legislation on Cadmium Products Cell Phone Recycling Act

- **AB 2901 Enacted September 29, 2004**
- **Requires Cell Phone Collection & Recycling**
- **Cost Paid by Producers and Consumers of Cellular Telephones**
- **Producers “should reduce and, to the extent feasible, ultimately phase out the use of hazardous materials in cell phones.”**
- **No Reference to 2002/95/EC as in SB 20**

International Cadmium Issues

- **UNECE LRTAP Heavy Metals**
- **OECD Programs on Metals**
- **UNEP Programs**
- **WHO / FAO PTWI for Cadmium**
- **G8 “3R’s” Initiative**

UNECE LRTAP Heavy Metals Protocol

- **Entered into Force 29 December 2003**
- **WGSR Meeting in Geneva Sept 2004**
 - **Task Force Formed to Review HM Protocol**
 - **Headed by Dieter Jost of Germany**
 - **Industry Will Be Able to Participate**
 - **No New Metals or Products Proposed**
 - **Discussion of Critical Loads and Effects-Based Approach, not Supported by USA and Canada**
- **First Meeting of the Parties Dec 2004**

OECD Programs on Metals

- **Nickel-Cadmium Battery Recycling**
 - **Collection Website Active**
 - **Experiences Document and Labeling Proposal Stalled by EU Intervention**
- **Chemical Product Policy (CPP)**
 - **Manage Impacts of Chemicals Throughout Their Life Cycle**
 - **Workshops Held in Japan and Sweden**

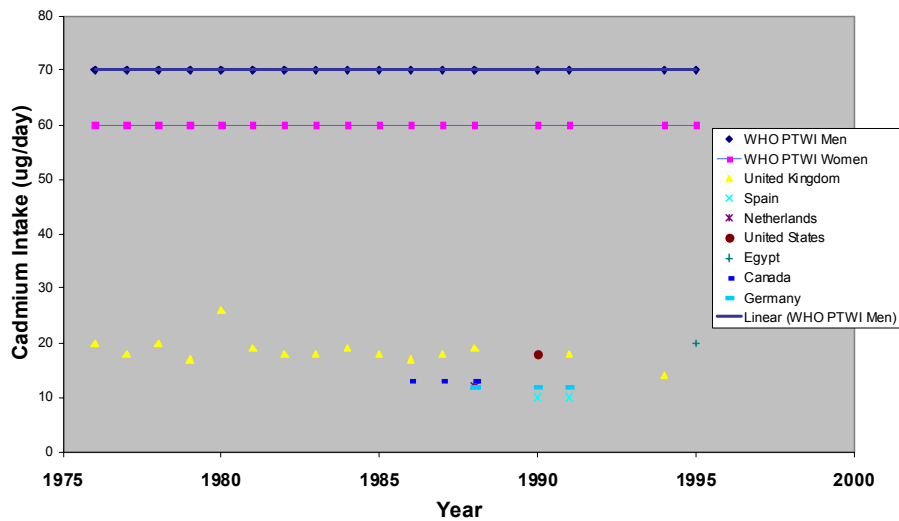
UNEP Programs on Metals

- **Heavy Metals Program**
 - Program on Mercury in Place
 - Nordics Propose Cd & Pb, USA Opposes
- **Strategic Approach to Integrated Chemicals Management (SAICM)**
 - Worldwide Approach to Chemicals
 - Supported by UNEP, IOMC, IFCS, WHO ...
 - Regional and Worldwide Meetings Held
 - Nordics Prioritizing Heavy Metals

WHO / FAO PTWI For Cadmium

- **Provisional Tolerable Weekly Intake for Cadmium set at 7 μg / kg bw or 1 μg / kg bw per day, equivalent to 60 to 70 μg per day for average persons**
- **Value Based on Renal Tubular Disease**
- **Reaffirmed in JECFA 2003 Meeting**
- **Daily Intake Values Today Have Decreased from 30 to 15 μg per day**

Dietary Cadmium Intake



G8 “3R’s” Initiative

- **Reduce Waste, Reuse and Recycle Resources and Products**
- **Proposed by Japan at G8 Sea Island Summit in June 2004**
- **G8 3R’s Ministerial Conference to be Held April 2005 in Japan**
- **OECD, UNEP, Basel to Attend**

G-8 “3R’s” Initiative

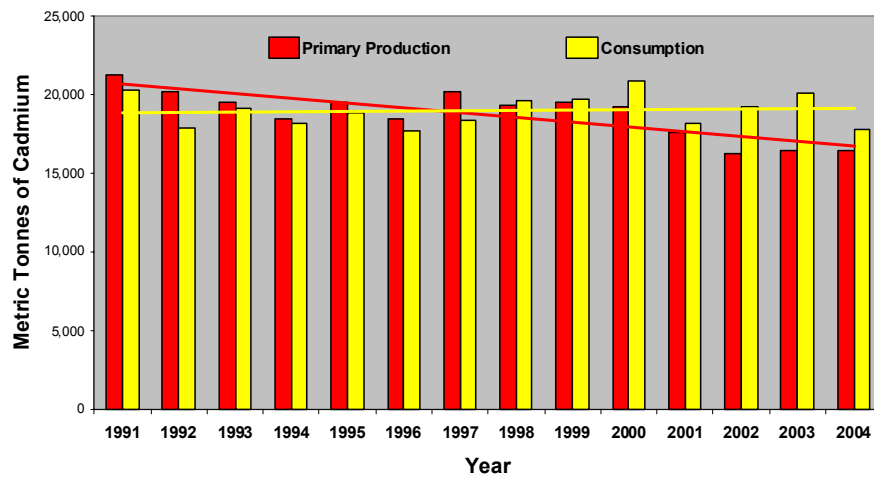
- **Issues for Discussion**
 - **National Policies to Implement 3Rs**
 - **Reduction of Barriers to Worldwide Flows of Goods and Materials**
 - **Cooperation among Stakeholders**
 - **Promotion of 3Rs Science**
 - **Cooperation of Developing Nations**

Cadmium Market Report

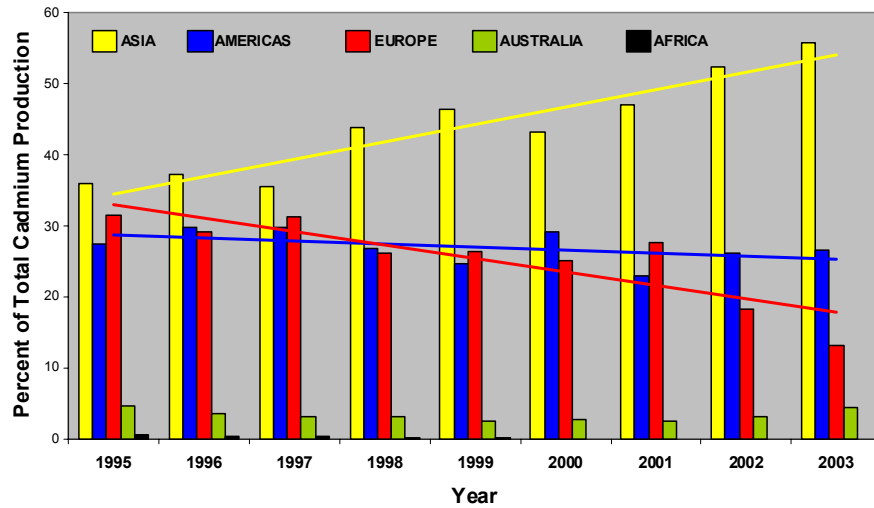
International Cadmium Association
General Assembly of Members

The Royal Aeronautical Society
4 Hamilton Place, London W1J 7BQ United Kingdom
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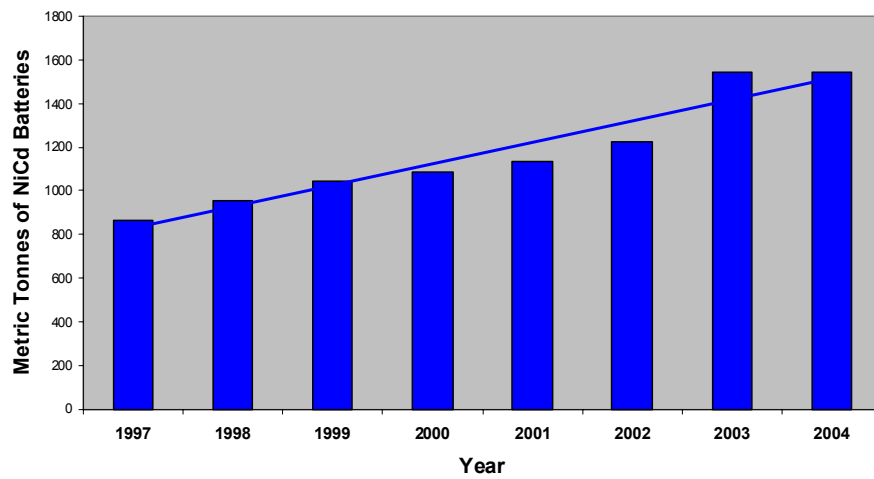
Cadmium Production and Consumption, 1991-2004



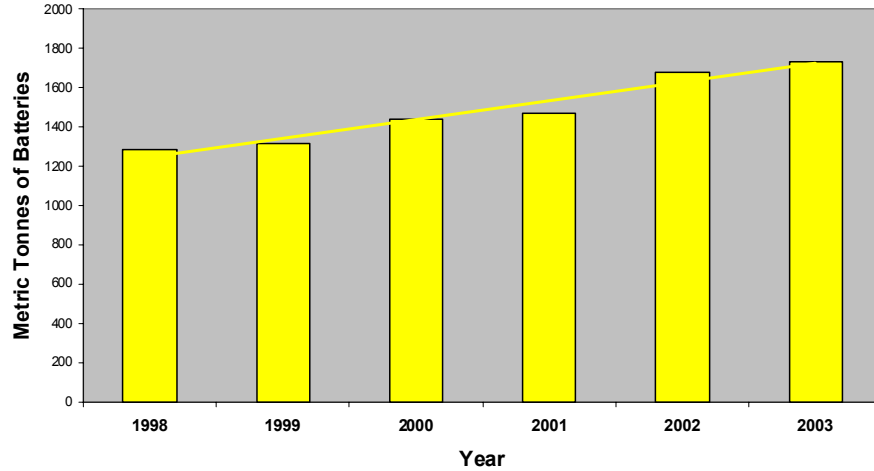
Geographical Cadmium Production, 1995-2003



Rechargeable Battery Recycling Corporation Nickel Cadmium Battery Collection, 1997 - 2004



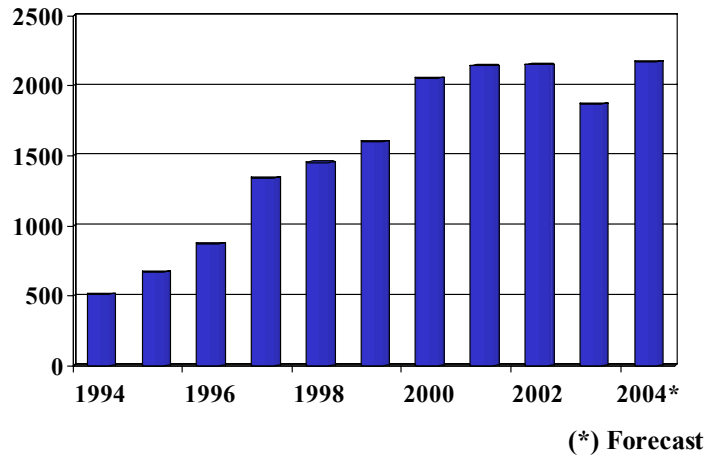
**Battery Association of Japan
Nickel Cadmium Battery Collection, 1998 - 2003**



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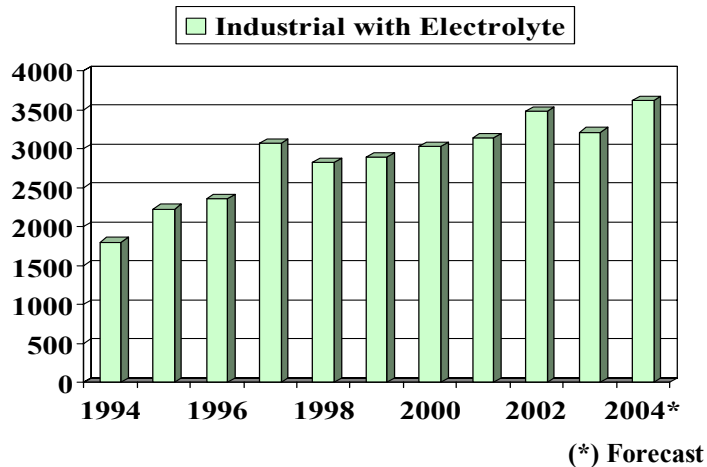
Sealed/Portable Ni-Cd Batteries

**Spent Portable Ni-Cd Batteries from European Sources
collected separately and processed in Recycling Plants
(15 EU MS + CH + N) - Data in Metric Tonnes per year**

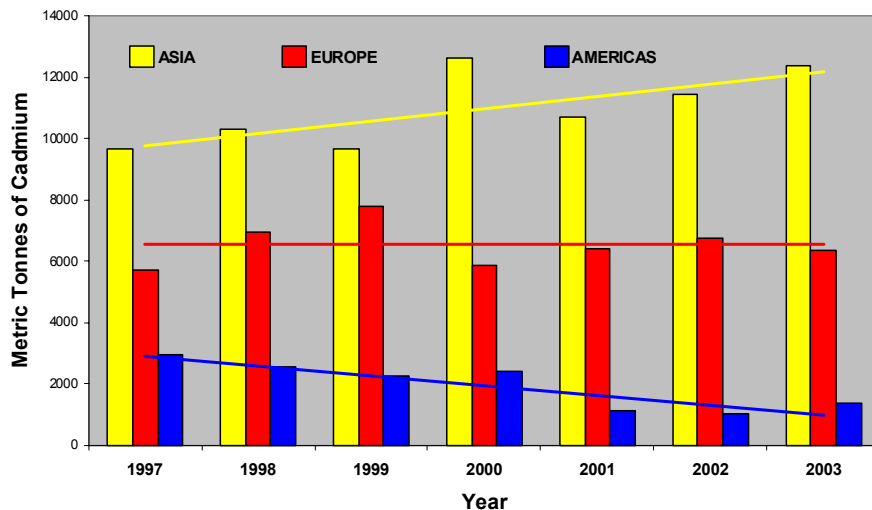


Industrial Ni-Cd Batteries

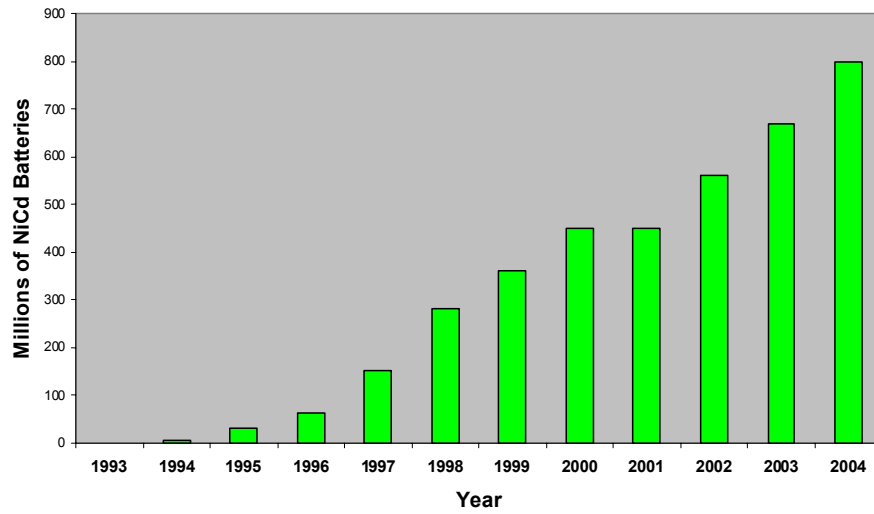
Spent Industrial Ni-Cd Batteries from European Sources collected separately and processed in Recycling Plants (15 EU MS + CH + N) - Data in Metric Tonnes per year



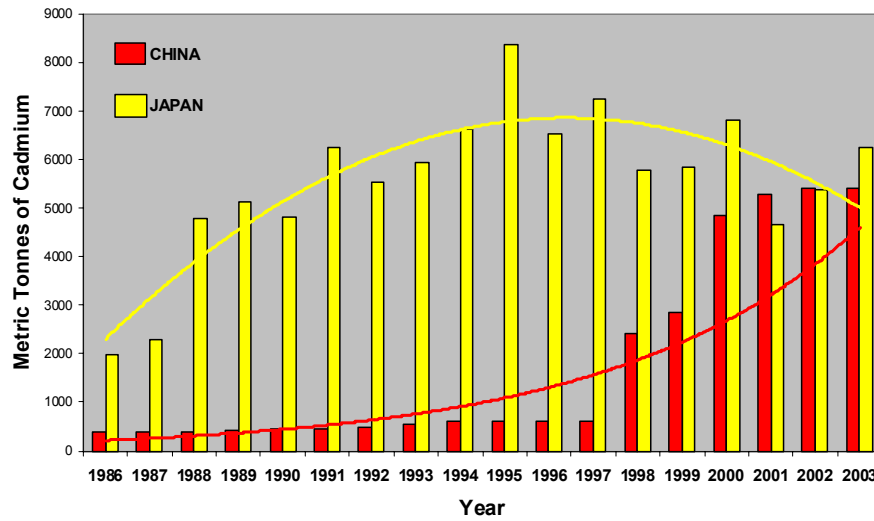
Geographical Cadmium Consumption, 1997 - 2003



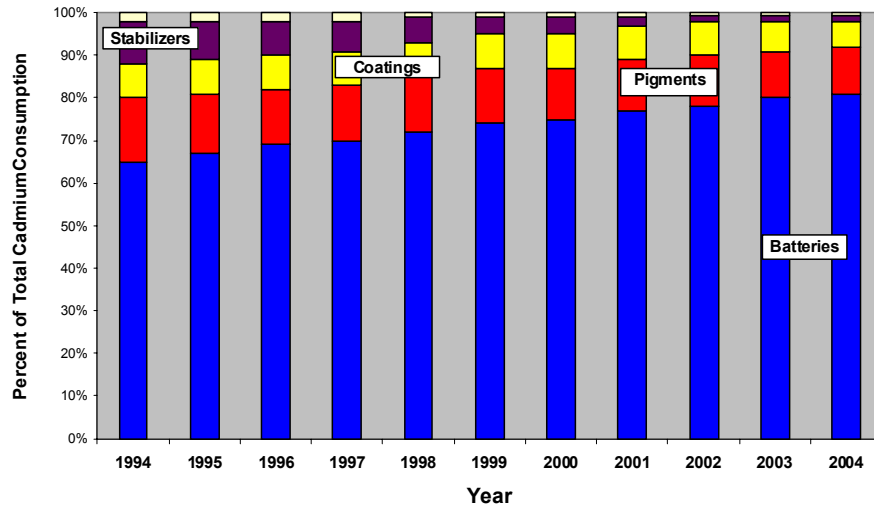
Chinese Nickel-Cadmium Battery Production



Chinese and Japanese Cadmium Consumption, 1986 - 2003

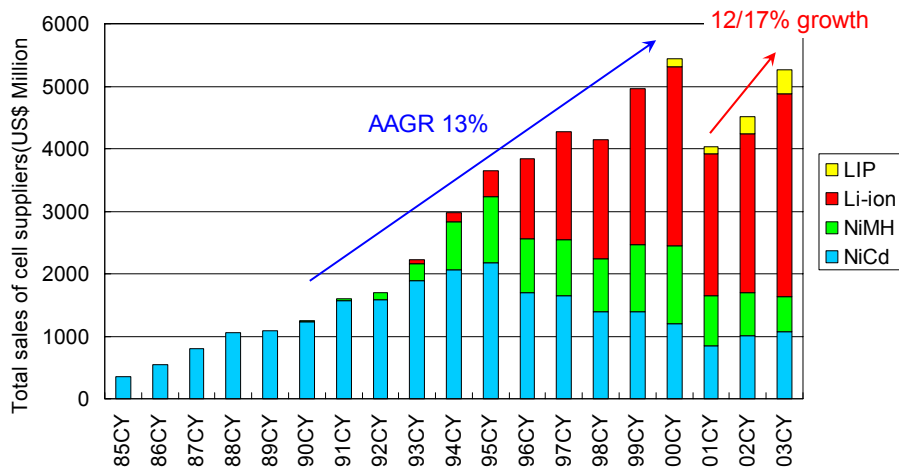


Cadmium Application Patterns, 1994 - 2004



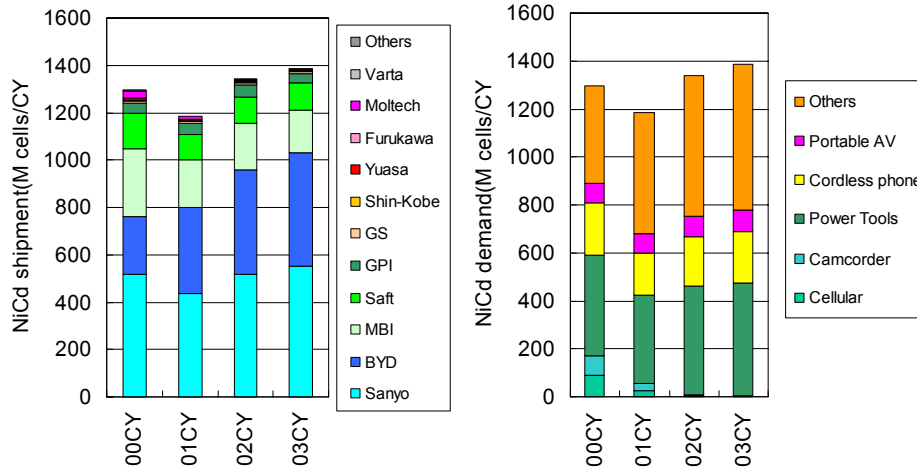
Quick recovery is realized by LIB/LIP growth

Fig.1 Worldwide portable battery market in Value



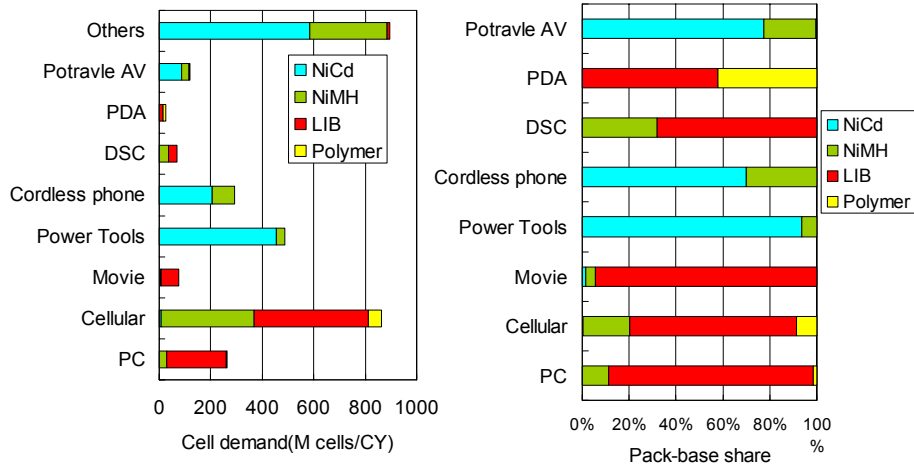
NiCd keeps the demand for power tools

Fig.4 NiCd shipment volume by supplier and application



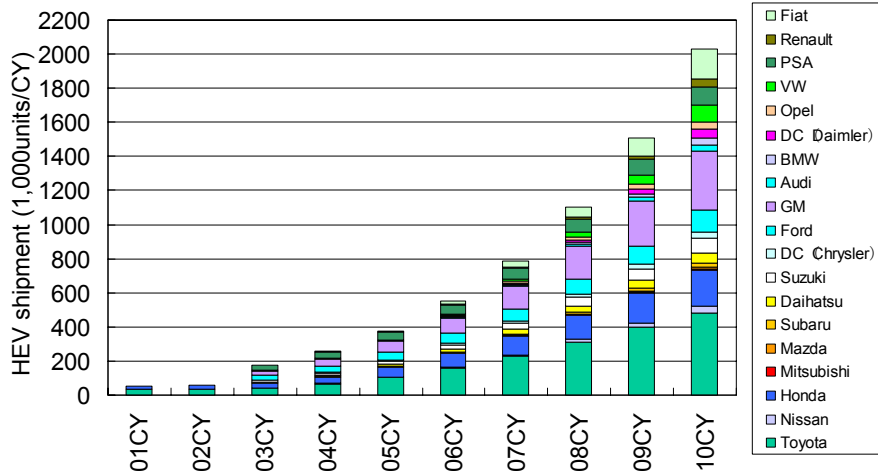
Legacy devices remain at NiCd, advanced devices move to LIB/LIP

Fig.5 WW portable battery shipment volume by application and pack-base share for each application (2002CY)



2M units x 500US\$ battery unit =
1B US\$ market

Fig.22 HEV market forecast



Metal Bulletin 99.99 Cd Price, 1993 - 2004

