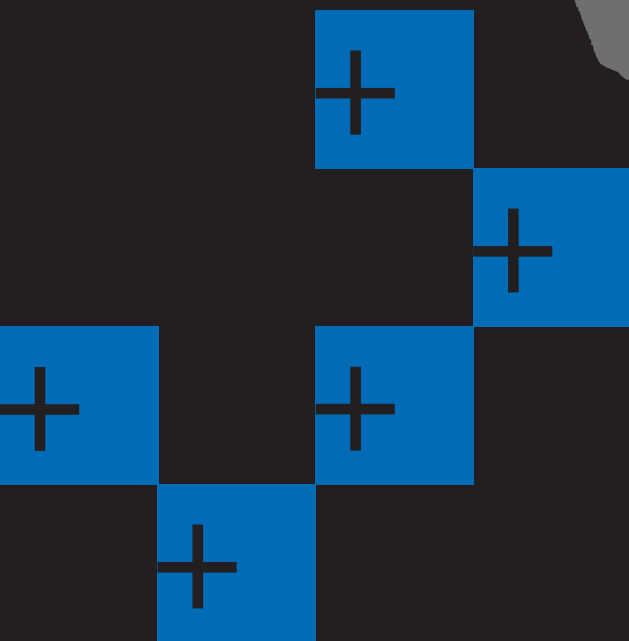


ENVIRONMENTAL SYSTEMS

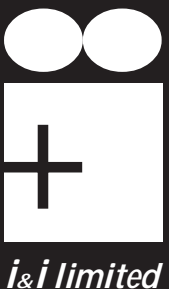
The North American Market 2000 - 2005



Intelligent Controls in Buildings



- DEMAND FORECAST
- MARKET DYNAMICS
- ROUTES TO MARKET
- SUPPLIER PERFORMANCE
- STRATEGIC OPTIONS
- WHAT THE BUYER WANTS
- TRADING PRACTICES



i&i limited

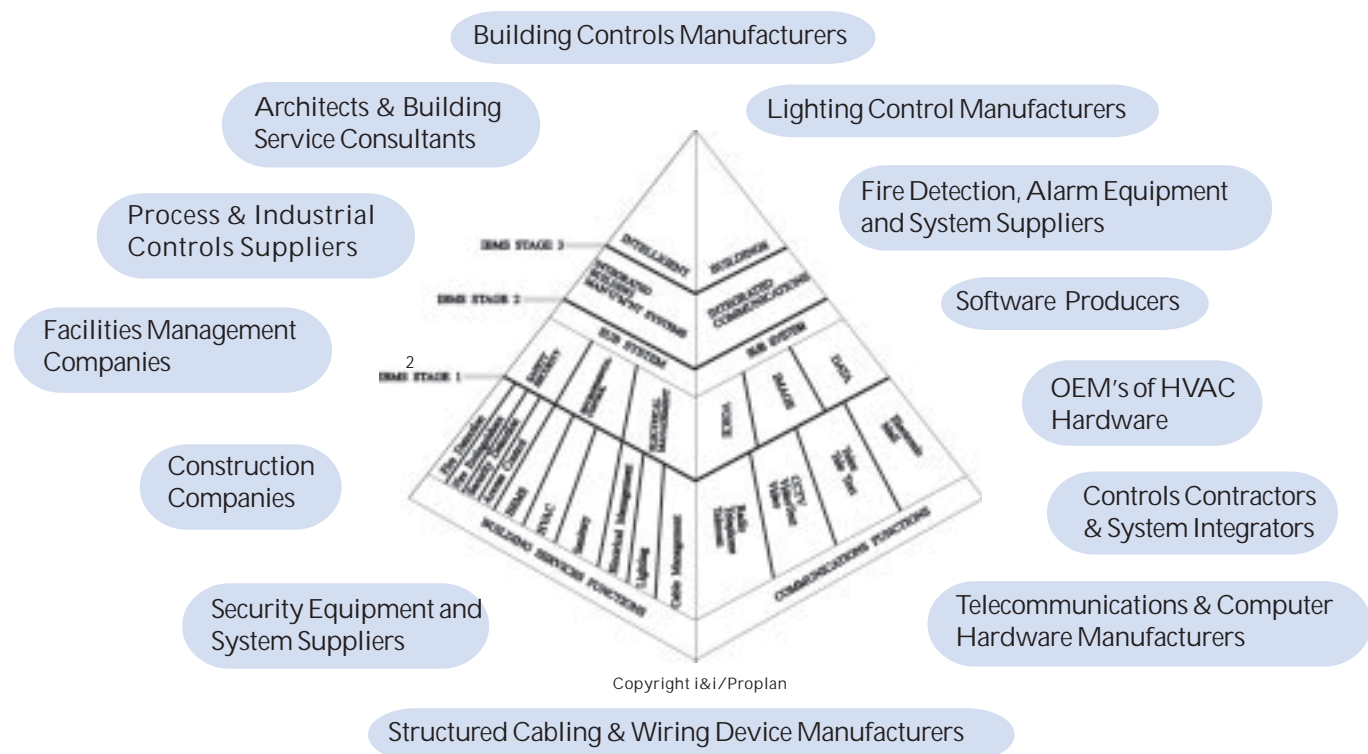
All you need to know to plan your marketing strategy in the USA and Canada



Introduction

This study is part of a series of multi-client reports on the world's markets for Intelligent Controls in non-domestic buildings. This is our second study of the North American Market for environmental building control systems and, based on data from manufacturers representing more than 90% of sales to the market, is the most detailed report published on this subject. Support from all the world's major manufacturers and suppliers over the last seventeen years has enabled us to develop a robust business model that takes account of inputs from all distribution channels and trends numerous market segmentations. This report presents product and system cost structure in North America over the last 7 years and compares with Europe and many other regions of the world. This 286 page report is split into two volumes, where volume I

comprises the executive summary, comparing findings such as supplier shares and market segmentations, and volume II provides detailed analysis covering the USA and Canada. Data on the past, present and future market for Intelligent Environmental Controls in Buildings, IBC(e)¹, is clearly presented in both quantitative and qualitative terms, enabling key issues regarding marketing and product strategies to be developed which fully exploit the opportunities in the market. Our model below represents the fundamental concept of an intelligent, integrated building on which this report builds. This shows the common building services and their hierarchy for integration. It identifies the main players involved in their specification, supply or integration and therefore for whom this report should make vital reading.



Definitions

¹ **IBC(e)**: Intelligent Building Controls - environmental controls: - Computerised / microprocessor products and systems that control/monitor environmental plant such as heating, ventilation, air conditioning in non-domestic buildings, comprising a central user

interface, communications network and data acquisition/direct digital controllers (DDC)

² **IBMS**: Integrated Building Management Systems - Systems that integrate two or more different building services under one contract.

Market Appreciation

The North American market is the world's largest single market for IBC(e). Between 1998 and 2000 the market grew at more than 16% per annum, a rate unprecedented for a developed market and exceeding the 10% per annum achieved in 1998.

But what forces are behind the tremendous recent growth and what will drive the market in the future? This report shows that buoyant new construction and expanding refurbishment business have played a key role. However, factors such as increased demand for improved indoor air quality, optimising energy consumption as electricity and natural gas prices escalate, and strong growth in integration and remote control of building services have also contributed to the growth and will help to sustain demand in the future.

This report manifestly demonstrates that this market, above all others, continues to offer the best opportunity in the developed world for sustained growth over the next five years and must be a priority for all aspiring suppliers. Despite tremendous growth in the last two years, the full potential of this market is simply not being realised.

North America has a larger building stock, a higher spend on building construction, installs much more air conditioning & refrigeration equipment, consumes more energy per square foot, has a higher number of heating and cooling degree days than any other developed economy. Nevertheless, it spends no more on DDC controls per dollar of construction or per square meter of floorspace than the average across Europe, which is further pulled down by such relatively underdeveloped markets as France, Spain and Italy, and a 15% devaluation of the Euro against the Dollar over the last two years. So compared against northern Europe, the spend on DDC controls based on these benchmarks is even lower.

We reveal that it achieves 16% lower IBC(e) sales per

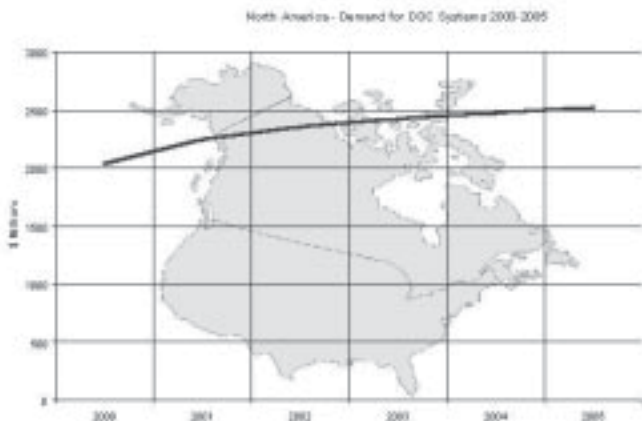


capita than Sweden, despite having construction output per capita that is 20% larger, and it takes 46% more construction output per capita than Germany to achieve just 18% more IBC(e) System sales per capita. Clearly, the penetration of advanced controls in North America should be very much larger than it is today.

Structural changes on the supply side are taking place, with manufacturers gradually moving from vertical to horizontal structures in order to focus and concentrate effort on what they do best. In addition, virtually all IBC(e) manufacturers are developing their distribution channels by the use of third party suppliers such as controls contractors and OEM's, and this is enabling intelligent controls to be applied to ever smaller buildings. This, combined with "intelligent packaged HVAC equipment" means that volume has become even more critical.

Common communication standards and migration towards information communications technology are rapidly redefining how this business operates. Demand for interoperability and IBMS are shaping the strategic positioning of numerous suppliers and the Internet is now allowing a host of new and traditional suppliers to web-enable installations, providing continuous remote monitoring and control at costs previously only dreamed of.

During this recent period of growth, unit prices do not appear to have been under great pressure, although functionality has continued to increase. However, new construction activity is expected to weaken and it is unlikely the market can maintain recent growth rates. As competition intensifies, prices will come under increasing pressure and manufacturers will need to develop innovative strategies to stay ahead. In the very near future we shall also see the use of the Internet by IBC(e) suppliers take another leap forward with the introduction of sophisticated e-business solutions.



Review

Within its 286 pages and over 150 charts and tables this report tells you:-

- The market size by end user sector and demand to 2005.
- The market size by type of project, new construction, refurbishment and retrofit and demand to 2005.
- The market size by contract value (4 segments).
- The market size by single, multiple & multi-site projects.
- The market size by type of hardware (7 products).
- The market size by type/end use of building (15 categories).
- The geographic distribution of sales
- The distribution channels and the volume of business that they handle comparing trends in "DDC product" and "DDC system sales"
- Sales and market share bands for all established suppliers, by DDC product, DDC system sales and total building controls, systems and services.
- Profiles of established suppliers provided in a standard format allowing comparisons to be made.
- An analysis of the major demand forces & buying motives.
- An analysis of the part played by all third party suppliers including ESCO's, Control Contractors and OEM's and the impact they are having on the business.
- A detailed analysis of the channels of distribution and emerging trends and the impact of contractual procedures.
- Technology which is the crux of structural change is reviewed under the headings:
 - Overview of Current & Emerging Technologies
 - Product Standards
 - Communication Standards
 - "Open" Systems
 - Communication Transmission Systems.
- Assesses the IBC(e) suppliers' influence on Integrated Building Management Systems (IBMS) and measures the incidence of fully integrated projects for seven different building services including lighting, security/CCTV, access, fire, smoke, electrical management and "others". Analyses the incidence of integration in nine different building types.

- Determines what the buyer wants from the IBC(e) supplier through the analysis of 14 different product factors and 16 company related factors, finally reviewing the buyer/end user "wish list".

This report takes you through the complex web of interdependent factors in a progressive and logical way, using more than 150 charts and tables, so that the issues that shape this market and influence change are clearly identified in order that their future impact can be assessed and the underlying trends discerned. It allows the following key questions to be answered:

- How and where can manufacturers protect their value added systems business and why the development of horizontal structures will strengthen their performance?
- Why is the penetration of DDC controls in North America low compared with similar developed markets and how can the latent potential be released?
- What does the Buyer need from the Supplier in both terms of product and company factors, and what is on his "wish list"?
- Where has progress been made in Integrated Building Management Systems. Will the recent developments in standard communication initiatives and IT speed it up?
- What will be the impact of a migration towards information communication technology and Internet protocols for the transmission and management of data from building controls systems and its integration within the wider enterprise environment as opposed to, or in combination with those that have been developed for the building controls industry?





i&i limited

i&i limited is Europe's leading research and consultancy company specialising in intelligent buildings. **i&i limited** provides a comprehensive range of professional services to suppliers, managers, government and industry. The Proplan division established in 1980 has analysed the markets and technology for building controls and services in 37 different countries in Western and Eastern Europe, Scandinavia, the Middle East, S.E. Asia and the Far East including Japan and China. Over one hundred assignments have been completed in marketing strategy, product planning, market assessment and evaluation and company/product image, using the same team of professionally qualified senior consultants. Through a series of multi-client studies entitled "Intelligent Controls in Buildings" we have charted the progress of intelligent controls in buildings and its players for nearly twenty years. Our objective has been to provide manufacturers and suppliers with accurate information on which to develop appropriate marketing and business strategies. This has been achieved through the assistance and co-operation of our clients who comprise the major suppliers to this business.

We research the following markets on a global basis under our branded title "Intelligent Controls in Buildings":

- Environmental (HVAC) Control Systems - IBC(e)
- Fire Detection Systems - IBC(f)
- Lighting Control Systems - IBC(l)
- Security Systems - IBC(s)
- Integrated Building Management Systems - IBMS
- Strategic Planning

We can supply tailored, single-client studies structured across global markets by building project, vertical market, country, in some cases a regional distribution within a country, on a range of topics including:

- Communication Elements & Computer Hardware
- Communication Standards
- Engineering and Commissioning
- Maintenance
- Sensors and Field Elements
- Supervisory Software
- Variable Speed Drives

Intelligent Controls in Buildings

For more information on these reports please visit our website: www.proplan.co.uk

ORDER FORM

	UNIT PRICE	QTY	TOTAL
 Complete report comprising the Executive Summary Vol 1 together with report " Intelligent Controls in Buildings - The North American Market 2000-2005 " in ring binders.	£3,950		
 Additional copies in ring binders	£350		
Additional CD ROM with a licence to print unrestricted quantities for exclusive use within own organisation	£750		

Payment must accompany order: I enclose my cheque for £..... made payable to **i&i limited**

Name	Position	Company
Address		
VAT no:	Country	
Nature of Business	Telephone	
Signed	Date	

This study is confidential. Unauthorised distribution of the information it contains harms the interests of the subscribers and **i&i limited**. Subscribers hereby certify that the study is only to be used by the personnel currently employed in their company and that it will not be communicated in any form to any other company, trade association or individual.

THIS REPORT IS PRINTED AND PRODUCED IN THE UNITED KINGDOM

Method of payment for overseas customers - Bank Transfer to NatWest Bank plc, Watford Junction Branch, 7 Station Road, Watford, Herts, WD1 1TH, United Kingdom for account number 86459929, sort code 60 22 40.

Please enclose a copy of the instructions to your bank with this order and **return to:**

i&i limited, Building 9, Bucknalls Lane, Garston, Watford, WD25 9XX, UK

Tel: +44 (0) 1923 66 59 50 Fax: +44 (0) 1923 66 59 51

CONTENTS

The North American Market 2000 - 2005

VOLUME I - EXECUTIVE SUMMARY

E1	OVERVIEW	3
E2	WORLD PERSPECTIVE	6
E3	MARKET STRUCTURE & SEGMENTATION	7
E4	ANALYSIS & COMPARISON OF IBC(e) MARKETS	10
E5	MARKET FORECAST TO 2005	14
E6	SUPPLY STRUCTURE	16
E7	ROUTES TO MARKET	19
E8	INDUSTRY DYNAMICS & DEMAND FORCES	21
E9	WHAT THE BUYER WANTS	22
E10	TECHNOLOGY & COMMUNICATIONS	23
E11	THE FUTURE OF IBMS	25
E12	STRATEGIC OPTIONS	26

VOLUME II - REPORT & ANALYSIS

1	INTRODUCTION	1
1.1	Scope/Definitions	3
1.2	Purpose/Appreciation	4
1.3	Procedure	5
1.4	Presentation	6

PART I - MARKET ANALYSIS SUPPLY SIDE

2	STRUCTURE & SEGMENTATION OF IBC(E) SALES	9
2.1	Market Analysis - Structure and Form	11
2.1.1	The Status of IBC(e)	11
2.1.2	A Seven Year Performance Review	13
2.1.3	Market Size by Type of Hardware and Software	14
2.2	Market Size by Sector	16
2.2.1	New Construction - Refurbishment - Retrofit	16
2.2.2	Public, Commercial and Industrial	17
2.2.3	Single, Multiple and Multi-Site Projects	18
2.2.4	Contract Size	19
2.2.5	Market Size By End User Sector	20
2.3	Geographic Distribution	21

3 BUILDING CONSTRUCTION - STOCK - FUTURE IBC(e) POTENTIAL UNITED STATES

U3.1	USA Public Sector	24
U3.1.1	New Construction & Major Refurbishment	24
U3.1.2	Building Stock	25
U3.1.3	Market Size by Building Type for North America	27
U3.1.4	Future Potential for North America	27

U3.1 USA Commercial Sector

U3.2.1	New Construction & Major Refurbishment	28
U3.2.2	Building Stock	29
U3.2.3	Market Size by Building Type for North America	31
U3.2.4	Future Potential for North America	32

U3.1 USA Industrial Sector

U3.3.1	New Construction & Major Refurbishment	33
U3.3.2	Building Stock	34
U3.3.3	Market Size by Building Type for North America	35
U3.3.4	Future Potential for North America	35

C3.4 Canada Public Sector

C3.1.1	Public New Construction & Major Refurbishment	37
C3.4	Canada Private Commercial Sector	38
C3.1.1	Commercial New Construction & Major Refurbishment	38
C3.4	Canada Industrial Sector	39
C3.1.1	Industrial New Construction & Major Refurbishment	39

4 REGIONAL ANALYSIS & PERFORMANCE

U4	Regional Analysis & Regional Factors	42
----	--------------------------------------	----

U4.1	Geographic distribution of buildings and floorspace	42
------	---	----

U4.2	Geographic Distribution of Construction Activity in the Private Commercial Sector	44
------	---	----

U4.3	Geographic Distribution of Construction Activity in the Private Industrial Sector	46
------	---	----

U4.4	Climatic Zones	47
------	----------------	----

U4.5	Geographic Distribution of Energy Cost and Construction	49
------	---	----

U4.6	Conclusions	50
------	-------------	----

5 ENERGY END USE & TYPE OF HVAC HARDWARE

U5.1	Introduction - Energy End Use & Type of HVAC Hardware	52
------	---	----

U5.2	The Scope of Advanced Controls in Commercial Buildings	52
------	--	----

U5.3	Trends and Changes in Usage of HVAC Equipment in Commercial Buildings	54
------	---	----

U5.4	Patterns in the Application of Energy Efficient & Conservation Products & Services	56
------	--	----

6 SUPPLIER ANALYSIS

6.1	Introduction	58
6.2	Supplier Shares	60
6.3	supplier profiles	63
6.4	Third Party Suppliers	68
6.4.1	ESCO's	68
6.4.2	Controls Contractors (CC's)	69
6.4.3	System Integrators (SI's)	70
6.4.4	OEM's	70

7 TRADING PRACTICES & ROUTES TO MARKET

7.1	The Construction Business and Contractual Relationships	74
7.2	Purchasing Routes for IBC(e)	76
7.2.1	New Construction/Refurbishment	76
7.2.2	Retrofit	78
7.2.3	Future Trends	78

8 INDUSTRY DYNAMICS & GROWTH PROSPECTS

8.1	Demand Drivers - Transient	82
8.1.1	Deregulation of the Electricity Supply Industry	82
8.1.2	Y2K Problem	84
8.1.3	Chiller Replacement	85
8.1.4	Performance Contracting	86
8.2	The Dynamics of the Market Place	87
8.3	The Present Status of IBC(e) Penetration	88
8.4	Factors For and Against Growth	92

9 MARKET SIZE AND FORECAST TO 2005

9.1	DDC System Sales	96
9.2	DDC Product Sales	99

10 THE DEVELOPMENT OF INTEGRATED BUILDING MANAGEMENT SYSTEMS

10	Introduction - Development of IBMS	101
10.1	INTEGRATION BY VERTICAL MARKETS	103
10.2	INTEGRATION BY BUILDING SERVICES	104

11 CONTROLS CONTRACTOR BUSINESS

11.1	Introduction	110
11.2	the structure of the controls contractor business	112

PART II - MARKET ANALYSIS DEMAND SIDE

12 FORCES THAT DETERMINE DEMAND

12.1	Introduction	119
12.2	Demand Side Factors	120
12.2.1	Energy conservation and Deregulation	121
12.2.2	Indoor Air Quality (IAQ)	124
12.3	Supply Side Factors	126
12.3.1	Supply Capacity/Capability	126
12.4	The Future	127

13 WHAT THE BUYER WANTS

13.1	Introduction	131
13.2	Buyer Motivation	132
13.3	The Relative Importance of Product Factors	134
13.4	The Relative Importance of Company Factors	137
13.5	Buyer End User "Wish List"	139

14 TECHNOLOGY

14.1	Overview of Current & Emerging Technologies	145
14.2	Product Standards	149
14.3	Communication Standards	151
14.3.1	BACnet	151
14.3.2	Echelon-LonWorks	158
14.3.3	Canadian Automated Building Protocol (CAB)	162
14.4	"Open Systems"	165
14.4.1	"Open Systems" Through Common Supervisory Software	165
14.4.2	"Open Systems" Through IT Networks	166
14.4.3	The Internet for Control Systems	167
14.5	Communication Transmission Systems	168
14.5.1	Introduction	168
14.5.2	Structured Cabling Systems	170

15 DEVELOPMENT OPPORTUNITIES FOR IBMS

15.1	Introduction	173
15.2	The Evolution of IBMS	175
15.3	Organising the Supply Side	178
15.4	Priority Markets	181
15.5	Effective Implementation	185

GENERAL APPENDIX

1	Glossary	191
2	Number of Buildings and Total Floorspace	205
3	Third Party Suppliers	206
3.1	Energy Service Companies (ESCO's)	206
3.2	Original equipment manufacturers (oem's)	206
3.3	Controls Contractors (CC's) - Systems Integrators (SI's)	208

APPENDIX UNITED STATES

U1	North America	211
U2	Economic Outlook	213
U3	Listing of controls contractors	228
U4	Listing of major contractors	231
U5	Listing of engineers	233
U6	Listing of architects	233
U6	Listing of energy service companies	235
U7	Listing of deregulated electricity suppliers	237
U8	Listing of electricity suppliers	248
U9	Installation List of Systemax SCS Intelligent Building Projects	250

APPENDIX CANADA

Economic outlook - Canada	253
---------------------------	-----

Intelligent Controls in Buildings

