



STAFF REPORT

# Heating, Ventilation and Air Conditioning: *Global Markets*

August 2018

*BCC Research Staff*

Report Code: ENG015A

# Table of Contents

- Chapter 1: Introduction ..... 2
  - Overview ..... 2
  - Study Goals and Objectives..... 3
  - Reasons for Doing This Study..... 3
  - Scope of Report..... 3
  - Intended Audiences ..... 4
  - Methodology and Information Sources..... 4
  - Geographic Breakdown..... 5
  - Analyst’s Credentials..... 10
  - Related BCC Research Reports..... 10
- Chapter 2: Summary and Highlights..... 12
- Chapter 3: Market Overview..... 15
  - Introduction ..... 15
  - Types and Components of HVAC Systems ..... 15
    - Heating ..... 15
    - Ventilation..... 16
    - Air Conditioning..... 16
  - Market Dynamics of HVAC Systems..... 16
    - Consumer Interest in Return on Investment ..... 16
    - Energy Conservation and Saving ..... 17
  - Global Market Drivers..... 18
    - Growth in Industrial and Building Automation Technology..... 18
    - Increased Demand for Automated Vehicle Functions ..... 19
    - Surge in Smart Sensor Adoption in Multiple Industry Applications..... 19
  - Global Market Restraints ..... 19
    - High Competition for Smart Sensor Pricing..... 19
    - Sensor-to-Sensor Communication Challenges ..... 19
  - Environmental Issues ..... 20
    - Global Warming..... 20
    - HVAC Expansion and Energy Consumption..... 21
    - Ozone Layer Protection ..... 21
  - Global Market Opportunity ..... 22
    - Advancement in the Internet of Things (IoT) ..... 22
  - HVAC Value Chain ..... 23
  - Key Value Chain Participant and Their Interactions ..... 23
    - Raw Material Supplier ..... 24
    - Product Designer and Manufacturer..... 24
    - Measurement and Testing: ..... 24
    - End Users..... 24
  - Recent Market Trends ..... 25
    - HVAC Systems and Refrigeration: Smart Technology Drives Efficiency..... 25
    - Green Buildings are Evolving..... 25
  - Technology Issues ..... 25
    - Energy Efficiency Issues..... 25
    - Building Design, Integration, and Commissioning..... 27
    - Commercial and Residential HVAC and the Internet of Things..... 29

Embedding the Internet of Things.....	29
Upcoming Technology Developments .....	30
Cooling Technology Developments.....	30
Heating Technology Developments .....	31
Home Automation Technology Developments.....	31
New Research and Development Programs.....	31
HVAC, Technology Drivers, Regulations and Market Strategies .....	32
<b>Chapter 4: HVAC Systems and Component Types .....</b>	<b>34</b>
Market Evolution of Commercial and Residential HVAC Technologies.....	34
Heat Pumps.....	34
Furnaces and Boilers.....	35
Unitary Systems .....	36
Ductless Cooling Systems.....	36
Engineered Cooling Systems .....	37
Radiant Heating and Cooling Systems .....	37
Ventilation Systems .....	38
Variable Refrigerant Flow .....	38
District Heating and Cooling .....	38
<b>Chapter 5: Market Breakdown by Type.....</b>	<b>41</b>
Introduction .....	41
Market Size and Forecast .....	42
HVAC Systems (Traditional) .....	42
Introduction.....	42
Market Size and Forecast .....	42
Smart HVAC Systems.....	44
Introduction.....	44
Market Size and Forecast .....	44
<b>Chapter 6: Market Breakdown by End-user Application .....</b>	<b>47</b>
Introduction .....	47
Residential.....	49
Introduction.....	49
Market Size and Forecast .....	49
Commercial .....	51
Introduction.....	51
Market Size and Forecast .....	51
Industrial .....	53
Introduction.....	53
Market Size and Forecast .....	53
<b>Chapter 7: Market Breakdown by Implementation Type .....</b>	<b>56</b>
Introduction .....	56
Market Size and Forecast .....	56
New Construction .....	57
Introduction.....	57
Market Size and Forecast .....	58
Retrofitting and Replacement.....	59
Introduction.....	59
Market Size and Forecast .....	60

<b>Chapter 8: Market Breakdown by Region .....</b>	<b>63</b>
Introduction .....	63
North America.....	64
Introduction.....	64
Market Size and Forecast .....	65
Europe.....	67
Introduction.....	67
Market Size and Forecast .....	67
Asia-Pacific .....	69
Introduction.....	69
Market Size and Forecast .....	70
Rest of the World .....	72
Introduction.....	72
Market Size and Forecast .....	72
<b>Chapter 9: Competitive Analysis .....</b>	<b>75</b>
Competitive Factors in the HVAC Industry .....	75
Major Strategic Development.....	75
Key Market Developments .....	76
<b>Chapter 10: Company Profiles .....</b>	<b>80</b>
<b>About BCC Research .....</b>	<b>122</b>
About BCC Research.....	123
BCC Membership .....	123
BCC Custom Research .....	123

# List of Tables

Summary Table: Global Market for HVAC Systems, by Region, Through 2023 (\$ Billions) .....	13
Table 1 Global Market for HVAC Systems, by Type, Through 2023 (\$ Billions) .....	42
Table 2 Global Market for HVAC Systems (Traditional), by Region, Through 2023 (\$ Billions) .....	43
Table 3 Global Market for Smart HVAC Systems, by Region, Through 2023 (\$ Billions) .....	45
Table 4 Global Market for HVAC Systems, by End-user Application, Through 2023 (\$ Billions) .....	48
Table 5 Global HVAC Systems Market for Residential End-user Application, by Region, Through 2023 (\$ Millions) .....	50
Table 6 Global HVAC Systems Market for Commercial End-user Application, by Region, Through 2023 (\$ Billions) .....	52
Table 7 Global HVAC Systems Market for Industrial End-user Application, by Region, Through 2023 (\$ Billions) .....	54
Table 8 Global HVAC Systems Market for Industrial Implementation, by Implementation Type, Through 2023 (\$ Billions) .....	56
Table 9 Global HVAC Systems Market for New Construction Implementation, by Region, Through 2023 (\$ Billions) .....	59
Table 9 Global HVAC Systems Market for Retrofit and Replacement Implementation, by Region, Through 2023 (\$ Billions) .....	61
Table 10 Global Market for HVAC Systems, by Region, Through 2023 (\$ Billions) .....	63
Table 11 North America HVAC Systems Market, by Country, Through 2023 (\$ Billions) .....	66
Table 12 Europe HVAC Systems Market, by Country, Through 2023 (\$ Billions) .....	68
Table 13 Asia-Pacific HVAC Systems Market, by Country, Through 2023 (\$ Billions) .....	71
Table 14 Rest of World HVAC Systems Market, by Country, Through 2023 (\$ Billions) .....	73
Table 15 Key Developments in the Temperature Sensor Industry, January 2016-June 2018 .....	76
Table 16 AAON Inc.: Net Revenue, 2015-2017 (\$ Millions) .....	81
Table 17 AAON Inc.: Products and Services .....	81
Table 18 AAON, Inc.: Strategic Development, May 2017-2018 .....	82
Table 19 Carrier Corp.: Net Revenue, 2015-2017 (\$ Millions) .....	84
Table 20 Carrier Corp.: Products and Services .....	84
Table 21 Carrier Corp.: Strategic Developments, 2018 .....	85
Table 22 Daikin Industries, Ltd.: Net Revenue, 2014-2016 (\$ Millions) .....	88
Table 23 Daikin Industries, Ltd.: Products and Services .....	89
Table 24 Daikin Industries: Strategic Developments, 2016-2018 .....	90
Table 25 Danfoss Group: Net Revenue, 2015-2017 (\$ Millions) .....	93
Table 26 Danfoss Group: Products and Services .....	93
Table 27 Danfoss Group: Strategic Developments, 2017-2018 .....	94
Table 28 Honeywell International, Inc.: Net Revenue, 2015-2017 (\$ Millions) .....	98
Table 29 Honeywell Group: Strategic Development, 2016 .....	99
Table 30 Honeywell International, Inc.: Products and Services .....	100
Table 31 Johnson Controls International: Net Revenue, 2015-2017 (\$ Millions) .....	102
Table 32 Johnson Controls International: Products and Services .....	102
Table 33 Johnson Controls International: Strategic Developments, 2017-2018 .....	103
Table 34 Siemens AG: Net Revenue, 2015-2017 (\$ Millions) .....	108
Table 35 Siemens AG: Products and Services .....	108
Table 36 Siemens International: Strategic Development, 2017-2018 .....	108
Table 37 TE Connectivity Ltd.: Net Revenue, 2015-2017 (\$ Millions) .....	111
Table 38 TE Connectivity Ltd.: Products and Services .....	111
Table 39 TE Connectivity Ltd.: Strategic Development, 2017-2018 .....	112
Table 40 Texas Instruments Inc.: Net Revenue, 2015-2017 (\$ Millions) .....	115

Table 41 Toshiba Corp.: Net Revenue, 2015-2017 (\$ Millions) ..... 117

# List of Figures

Summary Figure: Global Market for HVAC Systems, by Region, 2017-2023 (\$ Billions) .....	13
Figure 1 IoT Sensors: Value Chain .....	23
Figure 2 Global Market for HVAC Systems, by Type, 2017-2023 (\$ Billions) .....	41
Figure 3 Global Market for HVAC Systems (Traditional), by Region, 2017-2023 (\$ Billions) .....	43
Figure 4 Global Market for Smart HVAC Systems, by Region, 2017-2023 (\$ Billions) .....	44
Figure 5 Global Market for HVAC Systems, by End-user Application, 2017-2023 (\$ Billions) .....	48
Figure 6 Global HVAC Systems Market for Residential End-user Application, by Region, 2017-2023 (\$ Billions) .....	50
Figure 7 Global HVAC Systems Market for Commercial End-user Application, by Region, 2017-2023 (\$ Billions) .....	52
Figure 8 Global HVAC Systems Market for Industrial End-user Application, by Region, 2017-2023 (\$ Billions) .....	54
Figure 9 Global HVAC Systems Market for Industrial Implementation, by Implementation Type, 2017-2023 (\$ Billions) .....	57
Figure 10 Global HVAC Systems Market for New Construction Implementation, by Region, 2017-2023 (\$ Billions) .....	58
Figure 11 Global HVAC Systems Market for Retrofit and Replacement Implementation, by Region, 2017-2023 (\$ Billions) .....	60
Figure 12 Global Market for Temperature Sensors, by Region .....	63
Figure 13 Global Market Shares for HVAC Systems, by Region, 2017 (%) .....	64
Figure 14 North America HVAC Systems Market, by Country, 2017-2023 (\$ Billions) .....	65
Figure 15 North America HVAC Systems Market, by Application, 2017-2023 (\$ Billions) .....	66
Figure 16 Europe HVAC Systems Market, by Country, 2017-2023 (\$ Billions) .....	67
Figure 17 Europe HVAC Systems Market, by Application, 2017-2023 (\$ Billions) .....	69
Figure 18 Asia-Pacific HVAC Systems Market, by Country, 2017-2023 (\$ Billions) .....	70
Figure 19 Asia-Pacific HVAC Systems Market, by Application, 2017-2023 (\$ Billions) .....	71
Figure 20 Rest of World HVAC Systems Market, by Country, 2017-2023 (\$ Billions) .....	72
Figure 21 Rest of World HVAC Systems Market, by Application, 2017-2023 (\$ Billions) .....	73
Figure 22 Key Development Strategies in Global Market for HVAC Systems, 2015-2018 .....	75
Figure 23 Aeon, Inc.: Sales Share, by Business Segment, 2016 (%) .....	82
Figure 24 Aeon, Inc.: Sales Share, by Region, 2016 (%) .....	83
Figure 25 Carrier Corp.: Sales Share, by Business Segment, 2016 (%) .....	86
Figure 26 Carrier Corp.: Sales Share, by Region, 2016 (%) .....	87
Figure 27 Daikin Industries, Ltd.: Sales Share, by Business Segment, 2016 (%) .....	91
Figure 28 Daikin Industries, Ltd.: Sales Share, by Region, 2016 (%) .....	92
Figure 28 Danfoss Group: Sales Share, by Business Segment, 2017 (%) .....	94
Figure 29 Danfoss Group: Sales Share, by Region, 2017 (%) .....	95
Figure 30 Honeywell International, Inc.: Sales Share, by Business Segment, 2017 (%) .....	99
Figure 31 Honeywell International, Inc.: Sales Share, by Region, 2017 (%) .....	100
Figure 32 Johnson Controls International Plc: Sales Share, by Business Segment, 2017 (%) .....	103
Figure 33 Siemens AG: Sales Share, by Business Segment, 2017 (%) .....	109
Figure 34 Siemens AG: Sales Share, by Region, 2017 (%) .....	110
Figure 35 TE Connectivity Ltd.: Sales Share, by Business Segment, 2017 (%) .....	113
Figure 36 TE Connectivity Ltd.: Sales Share, by Region, 2017 (%) .....	114
Figure 37 Texas Instruments Inc.: Sales Share, by Business Segment, 2017 (%) .....	115
Figure 38 Texas Instruments Inc.: Sales Share, by Region, 2017 (%) .....	116
Figure 39 Toshiba Corp.: Sales Share, by Business Segment, 2017 (%) .....	118

Figure 40 Toshiba Corp.: Sales Share, by Region, 2017 (%) ..... 119





## *About BCC Research*

## *About BCC Research*

With our unparalleled 45-year history, BCC Research provides comprehensive analysis of global market sizing, forecasting and industry intelligence, covering markets where advances in science and technology are improving the quality, standard and sustainability of businesses, economies and lives.

## *BCC Membership*

From market sizing and forecasts, to opportunity assessments and competitive analyses, our ever-expanding library gives you the data, insights and intelligence required to ensure your project is a success. Members benefit from ongoing, unlimited access to the category or collections of their choice, and most membership packages pay for themselves within two to three reports being accessed.

Did you buy this report? You may qualify to apply your purchase price towards a full membership. Call 866/285-7215 or email [info@bccresearch.com](mailto:info@bccresearch.com) to request a demo.

## *BCC Custom Research*

Our experts provide custom research projects to those working to identify new markets, introduce new products, validate existing market share, analyze competition and assess the potential for products to impact existing markets. With impressive academic credentials and broad and deep knowledge of global industrial markets, our independent analysts and consultants develop the facts, figures, analysis and assessments to inform the decisions that will move your company ahead. Confidential inquiries to: [custom@bccresearch.com](mailto:custom@bccresearch.com) or 781-205-2429.

## DISCLAIMER

The information developed in this report is intended to be as reliable as possible at the time of publication and is of a professional nature. This information does not constitute managerial, legal or accounting advice, nor should it be considered as a corporate policy guide, laboratory manual or an endorsement of any product, as much of the information is speculative in nature. BCC Research and the author assume no responsibility for any loss or damage that might result from reliance on the reported information or from its use.

ISBN: 978-1-62296-824-4  
August 2018