

## Session1 - Opening session

ID	ID abstract	Topic	Individual	Country/Org.
1.1	40006	Welcome address by IOC Chairman	Thomas Kopp	IOC
1.2	40000	Welcome address by NOC Chairman	Momoki Katakura	NOC
1.3	40031	Address by Japan delegate Heat pump technology in Japan and NEDO'S recent role in heat pump development	Fumio Ueda	NEDO
1.4		Opening speech on behalf of the IEA	Nobuo Tanaka	IEA
1.5	40002	Opening address on behalf of the IEA The International Energy Agency's energy technology analysis: The role of heat pumps	Peter Taylor	IEA
1.6	40003	Address by the AHRI North / South America Overview of AHRI activities	Karim Amrane	AHRI
1.7	40004	Address by the EHPA: Europe / Africa Heat pumps in Europe – a “smart” future?	Thomas Nowak	EHPA
1.8	40005	Address by the JSRAE: Asia / Oceania JSRAE and advanced heat pump technologies	Noboru Kagawa	JSRAE
1.9	40007	Keynote: Roles of heat pumps in the platinum network	Hiroshi Komiyama	HPTCJ
1.10	40008	Regional report: North / South America Heat pumps in North America 2011	Gerald Groff	US
1.11	40009	Regional report: Europe / Africa Europe “heat pumps - status and trends”	M. Axell	SE
1.12	40010	Regional report: Asia / Oceania An overview of heat pumps in Asia / Oceania region	Makoto Tono	JP

## Session2 - Heat pumps for a sustainable society (policy and market)

ID	ID abstract	Topic	Individual	Country/Org.
2.1	00309	<b>Keynote: Natural refrigerants in heat pumps - A study of market and policy trends in the European Union and North America</b>	Nina Burhenne, Marc Chasserot	BE
2.2	40012	<b>Keynote: Buildings and heat pumps in the International Energy Agency's technology analysis</b>	Michael Taylor	IEA
2.3	40013	<b>Keynote: Climate change and the role of heat pumps</b>	Osami Kataoka	JRAIA
2.4	00295	The role of heat pumps to gain EU RES goals of 2020 in Finland	Jussi Hirvonen	FI
2.5	00136	Certification of heat pump installers	Onno Kleefkens, Thomas Nowak	NL
2.6	00012	Past and future of heat pumps in the Swiss energy strategy	R. P.-G. Phillips	CH
2.7	00023	Strategic promotion of heat pump system and its assignments	Katsuhiko Narita	JP
2.10	00003	SEPOMO-Build - a European project on seasonal performance factor and monitoring for heat pump systems in the building sector	Roger Nordman	SE
2.11	00009	Problems of the heat pumps introduction in Ukraine	A. Klepanda	UA
2.12	00040	The effectiveness, efficiency and burden of regulation in a market transformation process: the case of Canada	Denis Tanguay, Ted Kantrowitz	CA
2.13	00041	GSHP market growth in Canada: future opportunities, incentive programs and labour market strategies	Ted Kantrowitz, Denis Tanguay	CA
2.14	00097	Development of modified diffusion models for heat pump subsidy programs integrated with existing DSM programs	Sung-Wook Hwang, Hoon Jung, Jung-Hoon Kim	KR
2.15	00118	Policy trend of heat pump in Japan	Masanobu Sasaki	JP

ID	ID abstract	Topic	Individual	Country/Org.
2.16	00139	Comparison of heat pump SPF from field measurements with calculation methods	Roger Nordman, Kajsa Andersson, Monica Axell, Marcus Lindahl	SE
2.17	00157	C <sub>D</sub> value of cooling Seasonal Performance Factor	Keisuke Ohno, Kiyoshi Saito, Hokuto Nakamura, Hiromichi Murata, Isao Fujimoto, Katsuhiro Konishi, Yasuhisa Nakaso	JP
2.18	00198	The current state and future prospects of the German heat pump market	H. Staubitz, R. Stoffers	DE
2.19	00212	Current work within IEA HPP Annex 34 on performance evaluation and testing methods for thermally driven heat pumps for heating and cooling	Ivan Malenković, Patrizia Melograno, Annett Kühn, Peter Schossig	AT
2.20	00280	The evolution of the U.S. heat pump market	Melissa Lapsa, Gannate Khowailed	US
2.21	00299	Heat pump statistics: a key to heat pump recognition	Johan Berg, Roger Nordman, Monica Axell	SE

## Session3 - Systems and components

ID	ID abstract	Topic	Individual	Country/Org.
3.1	40015	<b>Keynote: Design of efficient capacity controlled air / water heat pumps</b>	B. Wellig	CH
3.2	00034	The sol-air heat pump system: recent development and future expansion	Toshiyuki Hino	JP
3.3	00204	Examination regarding air-conditioners and heat pumps, using the next generation refrigerants	Shigeharu Taira, Takeshi Yamakawa, Akinori Nakai, Ryuuzaburo Yajima	JP
3.4	00287	Latest developments in low global warming refrigerants for heat pump applications	Mark W. Spatz, Yongming Niu, Samuel F. Yana Motta, Elizabeth D. Vera Becerra	US
3.5	00278	Drop-in evaluation of refrigerant 1234yf in a residential integral heat pump water heater	Richard W. Murphy, Van D. Baxter, Edward A. Vineyard, Randall L. Linkous	US
3.6	00192	Optimizing heat pump design for refrigerants R407C and R410A	Eric Winandy, Enrico Fraccari, Guy Hundy	DE
3.7	00006	Heat pump systems with roof tile collector	Hansueli Bruderer, Martin Heuschkel, Hans Hohl	CH
3.10	00014	Development of an innovative 2.5kW silicagel-water adsorption chiller	Ernst-Jan Bakker, Robert de Boer, Simon Smeding, Niels Sijpheer, Michel van der Pal	NL
3.11	00017	Field test of desiccant humidity control system using water source heat pump	Kazuki Wada, Mikio Takahashi, Kitoshi Tanaka, Kazuhiro Miyamoto, Kouichi Mashimo	JP
3.12	00018	Dynamic modeling of heat pumps	Michael Uhlmann, Stefan S. Bertsch	CH
3.13	00026	Heating and cooling with heat pumps in Swiss residential buildings	Ralf Dott, Carsten Wemhöner, Thomas Afjei	CH
3.14	00027	Development and analysis of seasonal underground thermal-storage HVAC system using natural energy and pile foundation	Yuichiro Amano, Masanobu Aono, Toshihiro Yasuoka, Tadakatsu Takegawa, Yoshiyuki Nagura, Youichi Kobayashi, Harunori Yoshida, Masato Miyata, Jeong-soo Kim	JP
3.15	00036	Economic and environmental evaluation of CO <sub>2</sub> heat pump systems to supply hot water for a hospital	Shu Yoshida, Keisuke Hoshino, Koichi Ito, Yoshiharu Amano, Takumi Hashizume	JP

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3.16	00048	An overview of energy-saving heat pump test facility "heat pump lab"	Hiroshi Nakayama, Yoshinari Iwata, Ichiro Sakuraba, Katsuaki Nagamatsu, Masahiko Tokuda	JP
3.17	00057	Development of absorption heat pump chillers with improved heating efficiency by applying heat pump cycle	Tatsuo Fujii, Shuichiro Uchida, Noriyuki Nishiyama	JP
3.18	00060	Design and test of a small ammonia heat pump	Behzad A Monfared, Björn Palm	SE
3.19	00063	Application study of gas engine driven heat pump to heating equipments for cold climate	Takeshi Yokoyama, Takashi Murakami, Yuma Furuhashi	JP
3.20	00064	Performance evaluation of multiple air-conditioning systems providing simultaneous cooling and heating for buildings	Jiro Tarama, Masaya Hiraoka, Hideharu Komoda, Ichiro Sakuraba, Katsuaki Nagamatsu, Yoshinari Sawada	JP
3.21	00065	Evaluation of energy conservation by using hot water centrifugal heat pump with inverter motor drive	Ken-ichiro Nishii, Seiichi Okuda, Kenji Ueda	JP
3.22	00077	Air conditioning system of Umeda DT Tower	Takashi Shinojima	JP
3.23	00092	Software application for an ammonia-water absorption heat pump used for performance evaluation	Dragos Hera, Catalina Vasilescu	RO
3.24	00116	Analysis of energy systems supplying hot water and electricity for residential use	Akira Yoshida, Yoshiharu Amano, Koichi Ito, Takumi Hashizume	JP
3.25	00123	Practical study on energy saving method applied to existing HVAC system -Case of CEPCO Gifu branch office- Part.1 : HVAC system outline and results of three years initial commissioning after completion	Shigehiro Ichinose, Kazuo Nakai, Ryoichi Kudo, Kazuyasu Goda, Kazunobu Sagara, Taizou Kiriya, Yoshihiro Hazumoto	JP
3.26	00128	Measurement of flow boiling heat transfer coefficient of CO <sub>2</sub> -oil mixtures inside a copper tube using electrical resistance method	L. Gao, W. Hamada, Y. Watanabe, T. Honda	JP
3.27	00129	Measurement of oil circulation ratio in CO <sub>2</sub> heat pump systems	L. Gao, A. Nakamura, Y. Watanabe, T. Honda, R. Takigawa, T. Shimizu	JP
3.28	00132	Analysis on energy saving potential of water-source heat pump in China	YiTai Ma, Chuntao Liu, Qiuxia Yuan, Li Zhao	CN
3.29	00146	Experimental and simulation results on a solar-assisted heat pump prototype for decentral applications	Ruschenburg Jörn, Baisch Katharina, Courtot François, Oltersdorf Thore, Herkel Sebastian	DE

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3.30	00153	Performance evaluation of VRF systems -1st report experimental evaluation of steady state driving-	Kuniyasu Matsumoto, Isao Fujimoto, Kiyoshi Saito, Keisuke Ohno, Hiromichi Murata, Hokuto Nakamura	JP
3.31	00154	Performance evaluation of VRF systems -2nd report: experimental evaluation of transient driving-	Hokuto Nakamura, Hiromichi Murata, Kiyoshi Saito, Keisuke Ohno, Isao Fujimoto, Kuniyasu Matsumoto	JP
3.32	00155	Performance evaluation of VRF systems using compressor curve method	Mugito Kikuchi, Keisuke Ohno, Kiyoshi Saito	JP
3.33	00156	Unsteady state simulation of VRF systems	Keisuke Ohno, Kiyoshi Saito, Hokuto Nakamura, Hiromichi Murata, Yukihiro Jinnō, Katsuhiko Konishi, Yasuhisa Nakaso	JP
3.34	00161	Practical study on energy saving method applied to existing HVAC system - Case of CEPCO Gifu branch office – Part.2: Operational improvement by utilizing user-oriented analysis of BEMS data	Kazuyasu Goda, Shigehiro Ichinose, Kazuo Nakai, Ryoichi Kudo, Kazunobu Sagara, Taizou Kiriya, Yoshihiro Hazumoto	JP
3.35	00188	Study of absorption/compression hybrid heat pump chiller utilizing solar energy	Takuro Yamada, Mitsuji Kawai	JP
3.36	00190	Intelligent energy management system: verification of an algorithm for reducing energy consumption in variable refrigerant flow	Manabu Akimoto, Masahiro Kawai, Katsuhiko Kobayashi	JP
3.37	00191	Development and evaluation of a new central air-conditioning system using underfloor chambers for Japanese condominiums	Masato Iguchi, Yuzo Sakamoto, Ryoichi Sakurai, Akira Satake	JP
3.38	00197	The experimental investigation of the dual evaporator type adsorption chiller	Takahiko Miyazaki, Yuya Tani, Yuki Ueda, Atsushi Akisawa	JP
3.39	00213	Development of high efficiency large capacity heat pump chilling unit using inverter twin-rotary compressor "Universal Smart X"	Akio Tateishi, Isao Kawabe, Tsutomu Masamoto, Kunio Muroi, Hideki Tanno, Yuuji Matsumoto	JP
3.40	00215	Energy and exergy analysis of double effect (parallel and series flow) absorption chiller systems	Yang Hu, Laura Schaefer, Volker Hartkopf	US
3.41	00218	Study on the characteristics of offset strip fin in a heat exchanger	Chan Ho Song, Seok Ho Yoon, Kong Hoon Lee, Ook Joong Kim	KR
3.42	00272	An online approximation assisted optimization of a novel air-cooled heat exchanger	Khaled Saleh, Reinhard Radermacher, Vikrant Aute, Shapour Azarm	US

## Session4 - Ground source heat pumps

ID	ID abstract	Topic	Individual	Country/Org.
4.1	40016	<b>Keynote: Global perspective on GSHP technology, Markets and applications: A bright future for a flexible technology</b>	Denis Tanguay	CA
4.2	00211	Evaluation of borehole GSHP performance for greenhouse in Japan	Huai Li, Katsunori Nagano, Makoto Nakamura, Yuanxiang Lai, Kazuo Shibata, HiKai Fujii	JP
4.3	00289	Overview and status of U.S. DOE's new ground-source heat pump program initiated in 2009	Patrick Hughes, Tina Kaarsberg, Ed Wall	US
4.4	00227	Possibility of economical and ecological snow melting system with a small size ground source heat pump system	Katsunori Nagano, Chunyue Jin	JP
4.5	00170	Experimental proof of seasonal performance of the ground source heat pump system applying variable water flow control and multi-split heat pump	Takao Katsura, Yasushi Nakamura, Katsunori Nagano	JP
4.6	00130	Heat pump for heating and hot water - experience from and improvement of a retrofit, ground-coupled installation	Per Fahlén	SE
4.7	00021	System boundaries for SPF-calculation	Andreas Zottl, Roger Nordman, Marek Miara, Heinrich Huber	AT
4.8	00160	Evaluation of a building integrated ground source heat pump using system performance factors	K.C. Edwards, D.P. Finn, J.M. Corberan, C.M. Montagud	IE
4.10	00013	In situ thermal response tests in greater Toronto area	Ron Xia, Julie Wan, Robert Mancini, Gino Di Rezze	CA
4.11	00022	Numerical simulation of vertical ground heat exchangers for ground source heat pumps	Jalaluddin, A. Miyara, K. Tsubaki, K. Yoshida	JP, ID
4.12	00028	Regression analysis on influence of various factors on heat transfer of vertical ground heat exchanger	Rui Fan, Xu Chen, Weiding Long, Changsong Zhang	CN
4.13	00045	A development of a heat pump for a thermal recovery system using CO <sub>2</sub> as a refrigerant	Hiroshi Soma, Kenji Iwasawa, Kenji Fukumiya	JP
4.14	00052	Standing column heat pump without bleed in a cold climate	Vasile Minea	CA

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4.15	00053	Development and case study on total optimal control system for heat sources	Itaru Murasawa, Hideki Yasukohchi	JP
4.16	00056	Design and evaluation of geothermal air-conditioning system using a ground heat exchanger	Mariko Kamiya, Masaya Hiraoka, Yusuke Suzuki, Toshiyuki Hino, Minoru Nikaidou, Eikichi Ono	JP
4.17	00062	Study on the thermal performance of ground heat source heat pump system	Gyuyoung Yoon, Hideharu Niwa, Masaya Okumiya, Hisataka Kitora	JP
4.18	00070	Air conditioning system with groundwater heat pump by aquifer thermal energy storage (ATES)	Masahiko Katsuragi, Yoshito Horino, Kiichi Numazawa	JP
4.19	00079	Distributed temperature measurements on a multi-pipe coaxial borehole heat exchanger	José Acuña, Björn Palm	SE
4.20	00086	Using deep geothermal energy for higher efficiency and lower costs in large heat pumps	Fabrice Rognon, Stéphanie Perret, Carole Schelker, Laurent Denervaud	CH
4.21	00088	Fluid dynamics and heat transport in CO2 geothermal heat probes	A. Grüniger, B. Wellig	CH
4.22	00105	The field measurement report of an office building using natural refrigerant, Tokyo, Japan	Keisuke Murata, Kazunari Ando, Hikaru Kobayashi, Mutsumi Yokoi, Kentaro Sekine, Choiku Yoshikawa	JP
4.23	00121	Improved integration of a 28m <sup>3</sup> seasonal thermal storage in the heating and DHW supply of a single family home with a geothermal heat pump and flat plate solar collectors	Peter Kurmann, Thierry Ursenbacher, Alain Tenconi	CH
4.24	00122	Economic comparison between ground source heat pump and air source heat pump	Xiaofeng Li, Yitai Ma, Qiuxiao Yuan	CN
4.25	00167	Study on ground source heat pump system applying PHC foundation piles and short term thermal energy storage	Hisashi Wakayama, Nobutaka Sato, Katsunori Nagano, Takao Katsura, Kindaichi Sayaka, Hiroshi Noda	JP
4.26	00171	Development of a computer aided simulation program for the ground source heat pump system combined cooling tower and its application	Takao Katsura, Katsunori Nagano, Yasushi Nakamura	JP
4.27	00182	Development of multi-source and multi-use heat pump system	Ryozo Ooka, Toshiyuki Hino, Haruki Sato, Keisuke Miyauchi, Dongkeol Shin, Yusuke Harada	JP
4.28	00206	GSHP system for commercial building	Katsunori Nagano, Yuanxiang Lai, Takao Katsura, Yasushi Nakamura	JP



ID	ID abstract	Topic	Individual	Country/Org.
4.29	00209	Geothermal heat pump system installed in main building of Obayasahi Corporaiton Technical Research Institute	Kenji Mikoda, Takashi Tsuchiya	JP
4.30	00217	Ground source heat pump system for net zero energy house	Katsunori Nagano, Takashi Kinumura, Makoto Nakamura, Takao Katsura, Atsushi Okamoto	JP
4.31	00256	The analysis on technology and method of ground thermal property test	Pingfang Hu, Qingfeng Meng, Qiming Sun, Fei Lei, Changsheng Guan	CN
4.32	00296	Assessment of national benefits of retrofitting existing single-family homes in United States with ground-source heat pump systems	Xiaobing Liu	US

## Session5 - Applications

ID	ID abstract	Topic	Individual	Country/Org.
5.1	40017	<b>Keynote: Progress of compression type heat pump system as the typical advanced case of “green innovation” and the promotion of energy saving by realizing the advanced heat pump air conditioning system</b>	Akira Yabe	JP
5.2	00175	Economic heating systems for low energy buildings in Sweden	Svein Ruud, Monica Axell	SE
5.3	00300	District heat driven absorption cooling of district cooling plants in Trondheim, Norway	Geir Eggen, Dagfinn Bell, Jon Anders Hagen, Aamund Utne	NO
5.4	00210	CO2 and primary energy consumption reductions potential with heat pump technologies in the food and beverage sector	Yasuhiro Sakamoto, Masashi Hanagata, Kazutoshi Ikeda	JP
5.5	00294	Ejector applications in refrigeration and heating: an overview of modeling, operation and recent developments	Zine Aidoun, Daniel Giguère, David A. Scott, Sophie Hosatte	CA
5.6	00208	Emerging heat pump concepts for low energy houses in the Netherlands	Sibe Jan Koster, Onno Kleefkens	NL
5.10	00010	Steam generation system using waste hot water	Yukihiro Fukusumi, Keisuke Kajiyama, Motoki Fujimura	JP
5.11	00024	Theoretical analysis and simulation of hybrid solid and liquid dehumidifier system	Yuan Weixing, Li Yunxiang, Wang Chenjie	CN
5.12	00025	Combining heat pumps with solar energy for domestic hot water production	Ralf Dott, Andreas Genkinger, Fabia Moret, Thomas Afjei	CH
5.13	00031	Ratingpractice of district heating & cooling facilities with heat pump using heat of stream water	Shigeru Kubota, Kenji Okano, Noboru Kashiwaya, Motoharu Hosoi	JP
5.14	00037	Development and demonstration of solar air conditioning system	K. Kajiyama, T. Yokoyama, R. Homma, N. Onda	JP
5.15	00038	Efficiency of heat pump systems under real operating conditions	M. Miara, Ch. Russ, D. Günther, T. Kramer, H-M. Henning	DE
5.16	00042	Study of a battery-free photovoltaic heat pump with thermal energy storage	Yang Yufei, Yuan Weixing	CN

ID	ID abstract	Topic	Individual	Country/Org.
5.17	00067	Application of heat pump system for eco-friendly vehicles	Toshihisa Kondo, Masatoshi Morishita	JP
5.18	00094	Industrial heat pump - contribution to global warming prevention and its issues	Shigeru Sakashita	JP
5.19	00096	Development of a kiln dried wood system using heat pump technology	Kimitaka Kadowaki, Akito Machida, Kousaku Nishida, Masashi Kato, Yukitaka Kato, Shuetu Saito	JP
5.20	00101	CO <sub>2</sub> emission mitigation effect by heat pump and evaporative humidifier	Mitsuo Harada, Toshihiro Nishikawa, Hideaki Ito, Toshihiko Kitamura	JP
5.21	00106	Measurement of total boiler efficiency in an operating factory in comparison with heat pump application	Shuichi Umezawa, Haruo Amari, Jin Yasuda, Hitoshi Kawamura, Shuzo Kato, Katsuhiko Kuse	JP
5.22	00108	Design / engineering of low CO <sub>2</sub> emission office building using heat pump and thermal storage	T. Itoh, K. Nakayama, H. Onojima	JP
5.23	00109	An absorption / compression hybrid system for high temperature heat pump	Naoki Endo, Satoshi Hirano	JP
5.24	00134	Long-term behaviour and performance of residential heat pumps in dwellings	Fabrice Rognon, Peter Hubacher	CH
5.25	00135	Application of a novel solar PV tri-generation heat pumping facade in a high performance building in Ankara	Biröl Kilkis	TR
5.26	00140	Optimizing low CO <sub>2</sub> solutions with heat pumps towards net-zero exergy communities of the future	Siir Kilkis	TR
5.27	00186	Perspective on the use of air-source heat pumps to reduce CO <sub>2</sub> emissions from greenhouses based on life cycle assesment	Masashi Hanagata, Fumiuyuki Goto, Kazuhiro Shoji, Hideyuki Mano, Toyoki Kozai	JP
5.28	00205	Tips for composing heat pump system for hot water supply equipment for commercial use	Ichiro Utsumi, Kazuyasu Goda, Michio Negishi	JP
5.29	00277	Development of heat pump system using together with cold storage and floor panel heating with thermobank	Kwang-il Choi, Jong-taek Oh, Won-yong Hwang	KR
5.30	00306	Development of energy performance comparison method for residential electric appliances – Application to air conditioners	Hoang-Luong Pham, Viet-Dung Nguyen, Ngoc-Anh Lai, Nguyen-An Nguyen, Shogo Tokura, Satoshi Nakamura	VN

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5.31	00307	The heat transfer character analysis and software program design for lake water-source heat pump system	Yunqing Fan, Jun Lu, Tetsuo Hayashi, Chuck Yu	JP
5.32	00308	A practical study on application of life cycle commissioning to a DHC plant during the operation and maintenance stage	M. Momota, T. Ibamoto, T. Inoue, R. Yanagihara, A. Okagaki	JP
5.33	00311	Analysis of a gas-driven absorption heat pumping system used for heating and domestic hot water preparation	Harald Moser, Rene Rieberer	AT
5.34	00298	Hybrid heat pump for waste heat recovery in Norwegian food industry	Stein Rune Nordtvedt, Bjarne R. Horntvedt, Jan Eikefjord, John Johansen	NO

## Session6 - Systems and components

ID	ID abstract	Topic	Individual	Country/Org.
6.1	40018	<b>Keynote: Refrigerants of the future</b>	Björn Palm	SE
6.2	00264	Studies on the effectiveness of river water source heat pumps and energy efficiency in winter	Xuelian Bai, Nanqiao Zhang, Zhenhuan Zhang, Yunzhou Zhang	CN
6.3	00032	A 10 kW indirectly fired absorption heat pump: concepts for a reversible operation	Annett Kühn, Christian Özgür-Popanda, Felix Ziegler	DE
6.4	00159	Experimental investigation of flow boiling heat transfer of HFO1234yf and R32 refrigerant mixture in a smooth horizontal tube	Minxia Li, Chaobin Dang, Eiji Hihara	JP, CN
6.5	00176	An experimental study on heat pump cycle using zeotropic binary refrigerant of HFO-1234ze(e) and HFC-32	Shigeru Koyama, Nobuo Takata, Sho Fukuda	JP
6.6	00068	Oil-free turbo-compressor stage for large-scale (100 kW) CO <sub>2</sub> heat pumps	Dirk I. Uhlenhaut, Markus J. Friedl, Michael V. Casey	CH
6.7	00201	Development of a domestic adsorption heat pump	S.J. Metcalf, Z. Tamainot-Telto, R.E. Critoph	GB
6.10	00050	Thermodynamic analysis of moderate / high temperature heat pump system using water as working fluid	Guoyuan Ma, Haixia Liu, Xin LI, Shuxue Xu	CN
6.11	00055	Dynamic-lumped parameter model of a heat pump - sensitivity analysis for performance optimization	R. Lepore, M. Remy, E. Dumont, M. Frère	BE
6.12	00059	Centrifugal compression turbo heat pump made by ECOP	Bernhard Adler, Sebastian Riepl, Karl Ponweiser	AT
6.13	00066	Field test of newly developed turbo heat pump for hot water	Shuichi Umezawa, Tamotsu Nakayama, Yasufumi Ebinuma	JP
6.14	00071	Study on isochoric specific heat capacity of HFC-32 + HFO-1234ze(e) mixture in the liquid phase	Kenichi Yamaya, Atsushi Matsuguchi, Noboru Kagawa	JP
6.15	00085	Study on effective use of the ice thermal storage system with simulation	Mingjie Zheng	JP

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6.16	00087	High efficient heat pumps for small temperature lift applications	I. Wyssen, L. Gasser, M. Kleingries, B. Wellig	CH
6.17	00090	R-1234yf mixtures for replacing R-407C in residential heat pumps	Marcello Bentivegni, Denis Clodic	FR
6.18	00115	Optimal operating method for a heat source system consist of centrifugal chillers	Satoshi Nikaido, Yoshie Togano, Yoshie Kanki, Kenji Ueda, Seiji Shibutani	JP
6.19	00120	Low-temperature absorption refrigeration integrated with polygeneration system	Hai Lu, Viktoria Martin	SE
6.20	00124	Energy recycling utilization system using chemical heat pump container	Hironao Ogura	JP
6.21	00137	The Switzerland heat pump research program	Thomas Kopp	CH
6.22	00141	Research on expander of CO2 transcritical water-to-water heat pump	Li Zhao, Yi-tai Ma, Min-xia Li, Hua Tian, Chun-tao Liu	CN
6.23	00177	Air-conditioning system with "humidity" and "temperature" individual control that uses highly effective compact desiccant system	Nobuki Matsui, Shuuji Ikegami, Yoshinori Narikawa	JP
6.24	00178	Experimental results and model calculations of a hybrid adsorption-compression heat pump based on a roots compressor and silica gel-water sorption	Michel van der Pal, Robert de Boer, Anton Wemmers, Simon Smeding, Jakobert Veldhuis, Jan-Aiso Lycklama a Nijeholt	NL
6.25	00183	Development of high speed pelton type expander-generator for recovery of the throttling loss in carbon dioxide refrigeration system	Takeshi Hikawa, Makoto Kojima	JP
6.26	00187	Electrically driven thermoacoustic heat pump	M.E.H. Tijani, S. Vanapalli, S. Spoelstra, J.A. Lycklama à Nijeholt	NL
6.27	00189	Microchannels for absorption / desorption of ammonia-water in a compression-resorption heat pump	Bora Aydin, Dennis van de Bor, Carlos Infante Ferreira	NL
6.28	00195	Quick selection of heat pump types and optimization of loss mechanisms	D.M. van de Bor, C.A. Infante Ferreira	NL
6.29	00199	Study on the control algorithm of the heat pump system for load change	Seok Ho Yoon, Kong Hoon Lee, Chan Ho Song, Ook Joong Kim	KR

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6.30	00225	CFD modeling of two-phase fluid separation in a flash tank used in a vapor injection heat pump cycle	Xing Xu, Yunho Hwang, Reinhard Radermacher, Hung M. Pham	US
6.31	00229	Systemic design method of ground coupled heat pump	Xiao Long, Zhu Qing-yu, Xu Wei	CN
6.32	00231	Study on optimal operation of solar energy system and ground source heat pump system	XiaoMei Feng, XinYu Zhang, Yu Zou, Ji Li	CN
6.33	00304	Theoretical study of thermally driven heat pumps based on double Organic Rankine Cycle: working fluid comparison and off-design simulation	Jonathan Demierre, Daniel Favrat	CH

## Session7 - Air source heat pumps

ID	ID abstract	Topic	Individual	Country/Org.
7.1	40019	<b>Keynote: The importance of air source heat pumps for zero energy buildings</b>	Shin-ichi Tanabe	JP
7.2	00149	Energy efficient air to air heat pump operating with R 1234yf	Sorina Mortada, Denis Clodic, Christine Arzano-Daurelle	FR
7.3	00305	A study of indirect GHG emissions for North American residential heating and cooling equipment	Robert B. "Dutch" Uselton	US
7.4	00054	Dual-energy source heat pump	Vasile Minea	CA
7.5	00046	Development and performance measurement of room air-conditioner suitable for house in cold region	Takafumi Nogawa, Katsuhiko Shimizu, Mitsuhiro Ishikawa, Ichiro Hongo	JP
7.6	00291	Development of a high performance air source heat pump for the US market	Omar Abdelaziz, Bo Shen, Zhiming Gao, Van Baxter, Ipseng lu	US
7.7	00270	Field test study on the performance of air source heat pump in low temperature in Beijing	W. Wang, J. Xiao, Q.C. Guo, W.P. Lu, Y.H. Zhao	CN
7.10	00072	Dynamic modeling of an air source heat pump water heater	Farouk Fardoun, Oussama Ibrahim, Assaad Zoughaib	LB
7.11	00081	Continuous capacity control – the key to high efficient air / water heat pumps	L. Gasser, I. Wyssen, M. Kleingries, B. Wellig	CH
7.12	00091	A national study of residential heat pumps in New Zealand	Lisa Burrough, Kay Saville-Smith	NZ
7.13	00099	Effect of frost on the heat transfer of fin-tube with multiple fins	Dong Keun Kwak, Seungyoum Kim, Keumnam Cho, Gaku Hayase	KR
7.14	00138	Experimental investigation on the performance of a moderate-temperature air-source heat pump with large temperature-difference across condenser	Tzong-Shing Lee, Wei-Chiang Huang	TW
7.15	00142	Performance analysis of high-temperature heat pumps installed in low-insulated dwellings: case of a single family house in Belgium	E. Dumont, C. Leveau, M. Frère	BE



ID	ID abstract	Topic	Individual	Country/Org.
7.16	00143	Performance monitoring of a high-temperature air to water heat pump with injection cycle installed in a low-insulated single-family house in Belgium	E. Dumont, M. Frère	BE
7.17	00162	Natural circulation defrosting in fin-and-tube heat exchangers with highly distributed refrigerant mass flow	T. Oltersdorf, S. Hoehlein, J. Wapler, H.-M. Henning	DE
7.18	00165	A two-phase thermosiphon defrosting technique for air-source heat pumps	Paul Byrne, Jacques Miriel, Yves Lénat	FR
7.19	00169	Characteristics of an innovative photoelectric sensor during periodical frost and defrost cycles	W. Wang, J. Xiao, Q.C. Guo, Y.H. Zhao	CN
7.20	00200	EU-US comparison of energy efficiency requirements for air-source heat pumps	E. Sikorski, E. Groll	DE
7.21	00219	Condensation and icing on cooled surfaces	Gernot J. Pauschenwein, Christoph Reichl, Bernd Windholz, Immacolata Moretti, Michael Monsberger	AT
7.22	00222	Research and development of next-generation heat pump water heater system	Shigeharu Taira, Shigehiko Matuoka, Kenji Morimoto, Yoshiki Ogawa, Kinichi Shimura	JP
7.23	00268	Study on operating characteristics of air source heat recovery heat pump unit in winter	Dong Liu, Yan Ding, Xin-lin Wang, Yong Cheng	CN
7.24	00283	Noise investigation of air-to-air heat pumps	Henrik Johansson, Ola Gustafsson, Krister Larsson, Monica Axell	SE
7.25	00284	Noise level in relation to energy performance of air-to-air heat pumps	O. Gustafsson, H. Johansson, P. Fahlén, M. Axell, K. Larsson	SE

## Session8 - Applications

ID	ID abstract	Topic	Individual	Country/Org.
8.1	40020	<b>Keynote: Heat pumps and the built environment</b>	Hermann Halozan	AT
8.2	00274	Field test of high efficiency residential buildings with ground-source and air-source heat pump systems	Moonis R. Ally, Jeffrey D. Munk, Van D. Baxter	US
8.3	00100	Measuring effectiveness of installing a turbo chiller on university hospital buildings - Todai Sustainable Campus Project -	Masashi Kawano, Masahiko Isobe	JP
8.10	00016	The actual operational situation of heat source facilities that utilized high efficiency heat pumps and thermal storage	Daisuke Kuboi, Yosuke Nakagawa	JP
8.11	00030	Establishing optimal heat pump system with water thermal storage - Simulation algorithm of TES_ECO and peripheral tools -	Tomoya Kawaji, Ryoichi Kudo, Nobuo Nakahara	JP
8.12	00039	Evaluating environmental benefits of ground source heat pumps: the strengths and weaknesses of COP and SCOP	Benjamin Hénault Jr. Ing., Denis Tanguay	CA
8.13	00051	On side refrigerant measurement of heat pump seasonal performances	C. T. Tran, P. Rivière, D. Marchio, C. Arzano-Daurelle, M. Coevoet	FR
8.14	00073	Energy saving of air-conditioning in mass merchandisers by operational change of air-conditioning system	Masafumi Hirota, Choyu Watanabe, Ichiro Sakuraba, Yoichi Miyaoaka, Hiroshi Nakayama, Ei-ichiro Ohashi, Naoki Maruyama, Akira Nishimura	JP
8.15	00084	A development of new highly effective ice thermal storage unit	Yasushi Ookoshi, Takuya Ito, Koji Fukui, Yasutaka Ochia, Hirokazu Ishige, Takuji Fujita	JP
8.16	00102	Further CO <sub>2</sub> emission mitigation by making of supply warm water temperature lower in the heat pump & evaporative humidifier system	Mitsuo Harada, Toshihiko Kitamura, Hideyuki Ito	JP
8.17	00103	Study on effective operation and energy-saving of VRF air conditioning system in case of operating by indoor-unit zigzag arrangement	Hiroyuki Arai, Tatsuo Nobe	JP
8.18	00104	Field measurement on the performance of VRV system by probe insertion method	Masayuki Kiguchi, Tatsuo Nobe	JP
8.19	00110	Performance of a heat pump water heater at variable conditions	Ling-Yu Chao, Hung-Wen Lin, Shy-Her Nian, Hsu-Cheng Chiang	TW

ID	ID abstract	Topic	Individual	Country/Org.
8.20	00117	The effect of introducing of heat pump for heat source system at the university - A case at Chuo University Tama Campus -	Hayato Ichimaru, Daisuke Sato	JP
8.21	00127	Energy management in heat pump-based HVAC system renovation project	Satoshi Inoue, Kazuo Nakai, Masaya Okumiya, Hideharu Niwa, Ryoji Muranishi	JP
8.22	00181	Actual condition investigation of high-efficiency large-capacity electric heat pump modular chilling units installed at large commercial facilities	Isao Iba, Yuji Ishida, Masahiko Hamamura, Toshiyuki Miyashita, Hideki Satou	JP
8.23	00203	Strategies for optimal operation of thermal storage type HVAC systems of a large scale laboratory building	Ryuji Yanagihara, Masashi Kawano	JP
8.24	00216	Performance analysis of a variable speed compact GSHP with desuperheater	David Blanco, Katsunori Nagano	JP
8.25	00223	Economic operation of an electricity-driven heat-pump DHC plant with large thermal storages	Xin Wang, Fulin Wang, Qingpeng Wei	CN
8.26	00228	Application analysis of combined operating mode of ground-coupled heat pump systems with solar thermal collector in residential buildings in Beijing area	Yuliang Pan, Wei Xu	CN
8.27	00232	Research on design of large sewage source heat pump energy station	Linyan Yang, Qingyu Zhu, Bin Lu	CN
8.28	00271	How the leed ventilation credit impacts energy consumption of GSHP systems — A case study for primary schools	Shaojie Wang, Xiaobing Liu	US
8.29	00279	DOAS heat pump with variable refrigerant flow (VRF)	Titu R., Florin Gavrilit	US
8.30	00281	Solar cooling: technologies and markets – status report based on IEA SHC TASK 38 “Solar air-conditioning and refrigeration”	Alexander Morgenstern, Hans-Martin Henning, Edo Wiemken, Tomas Núñez, Peter Schossig	DE
8.31	00285	Technical and economical review of thermally driven heat pumps	Stefan K. Henninger, Kai Thomas Witte, Gerrit Földner, Tomas Núñez, Peter Schossig	DE

## Session9 - Heat Pump Programme – reports from ongoing activities

ID	ID abstract	Topic	Individual	Country/Org.
9.1	40021	<b>Keynote: IEA Heat Pump Programme</b>	Sophie Hosatte, Monica Axell	CA, SE
9.2	00126	Annex 32: Heating and cooling in low energy houses - results of the international research project IEA HPP Annex 32	Carsten Wemhöner, Ralf Dott, Thomas Afjei	CH
9.3	40022	Annex 34: Thermally driven heat pumps for heating and cooling-aims and state of the art	Peter Schossig, Kai Thomas Witte, Stefan K. Henninger	DE
9.4	40023	Annex 35: Application of industrial heat pumps	Rainer Jakobs, Laurent Levacher, Hans-Jürgen Laue	DE, FR
9.5	40024	Annex 36: Quality installation / Quality maintenance sensitivity analysis	Glenn C. Hourahan, Piotr A. Domanski, Van Baxter	US
9.6	40025	Annex 37: Demonstration of field measurements of heat pump systems in buildings - good examples with modern technology	Pia Tiljander, Andreas Zottl, Ivan Malenković	SE
9.7	40026	Annex 38 : Solar and heat pump systems	Jean-Christophe Hadorn	CH
9.8	40027	Annex 39: A common method for testing and rating of residential HP and AC annual / seasonal performance	Roger Nordman	SE