



# 2020

1st December, 2020

Registration please refer to your home university contacts.

## Zhejiang-Kyoto-Ajou Joint Symposium on Energy Science(Online)



### Organized by

College of Energy Engineering, Zhejiang University  
Graduate School of Energy Science, Kyoto University  
Institute of Advanced Energy, Kyoto University  
Department of Energy Systems Research, Ajou University

### Co-organized by

NingboTech University  
University of Nottingham Ningbo China  
Ningbo Research Institute of Zhejiang University



## Participants

### Zhejiang University attendants are:

<b>Prof. Xiang Gao,</b>	Dean, College of Energy Engineering
<b>Prof. Zitao Yu,</b>	Vice Dean, College of Energy Engineering
<b>Prof. Qunxing Huang,</b>	Vice Dean, College of Energy Engineering
<b>Prof. Zheng Bo,</b>	Institute of Thermal Power Engineering
<b>Prof. Xuecheng Wu,</b>	Institute of Thermal Power Engineering
<b>Prof. Gang Xiao,</b>	Institute of Thermal Power Engineering
<b>Prof. Tao Wang,</b>	Institute of Thermal Power Engineering
<b>Prof. Linghong Chen,</b>	Institute of Thermal Power Engineering
<b>Prof. Tomoaki Kunugi,</b>	Institute of Process Equipment
<b>Research Prof. Qingyang Lin,</b>	Institute of Thermal Power Engineering
<b>Research Prof. Yingchun Wu,</b>	Institute of Thermal Power Engineering
<b>Research Prof. Liwu Fan,</b>	Institute of Thermal Science and Power Systems
<b>Associate Prof. Menglian Zheng,</b>	Institute of Thermal Science and Power Systems
<b>Associate Prof. Xiangguo Xu,</b>	Institute of Refrigeration and Cryogenics
<b>Dr. Ning Chu,</b>	Institute of Process Equipment
<b>Dr. Xiaojie Lin</b>	Institute of Thermal Science and Power Systems
<b>Dr. Liteng Wang</b>	Institute of Thermal Science and Power Systems
<b>Ms. Ruilin Zhu,</b>	Secretary of International Relations, College of Energy Engineering

### The delegation members of KU are:

<b>Prof. Keiichi Ishihara,</b>	Dean, Graduate School of Energy Science(GSES)
<b>Prof. Takashi Sagawa,</b>	Graduate School of Energy Science(GSES)
<b>Prof. Hideaki Ohgaki,</b>	Graduate School of Energy Science(GSES)
<b>Associate Prof. Mclellan Benjamin,</b>	Graduate School of Energy Science(GSES)
<b>Assistant Prof. Yutaka Okazaki</b>	Graduate School of Energy Science(GSES)
<b>Assistant Prof. Masatsugu Takada</b>	Graduate School of Energy Science(GSES)
<b>Assistant Prof. Takeshi Yabutsuka</b>	Graduate School of Energy Science(GSES)
<b>Assistant Prof. Chen Qu</b>	Graduate School of Energy Science(GSES)
<b>Assistant Prof. Jordi Cravioto</b>	Graduate School of Energy Science(GSES)



## **Zhejiang - Kyoto - Ajou Joint Symposium on Energy Science**

### **The delegation members of Ajou are:**

<b>Prof. Hye-Young Jang,</b>	Dean, Department of Energy Systems Research
<b>Prof. Byungmin Ahn,</b>	Vice Dean, College of Engineering
<b>Prof. Jae-Hyun Lee,</b>	Department of Energy Systems Research
<b>Prof. In-Hwan Lee,</b>	Department of Energy Systems Research
<b>Prof. Hyungwoo Lee,</b>	Department of Energy Systems Research

### **The delegation members of Ningbotech University are:**

<b>Prof. Changxing Hu,</b>	Vice Dean, College of Mechatronics and Energy Engineering
<b>Associate Prof. Neng Gao,</b>	College of Mechatronics and Energy Engineering
<b>Associate Prof. Nian Li,</b>	College of Mechatronics and Energy Engineering

### **The delegation members of UNNC is:**

<b>Prof. Tao Wu,</b>	Dean, the Faculty of Science and Engineering
----------------------	--

### **Volunteers are:**

<b>Wenya Liao</b>	(Zhejiang Univ., China)
<b>Junqiang Shao</b>	(Zhejiang Univ., China)
<b>Ke Yu</b>	(Zhejiang Univ., China)
<b>Yiping Hua</b>	(Zhejiang Univ., China)
<b>Jiaying Chen</b>	(Zhejiang Univ., China)
<b>Qiang Li</b>	(Zhejiang Univ., China)
<b>Siyun Li</b>	(Zhejiang Univ., China)



# Program Time Table

(Beijing Time)

**Tuesday, Dec 01**

**Opening Speech** Zoom ID: 446 879 1599 Code: 2020

8:00	<b>Welcome Speech</b> Prof. Xiang Gao Dean, College of Energy Engineering, ZJU
8:10	<b>Overview of Kyoto University</b> Prof. Keiichi N. Ishihara Dean, Graduate School of Energy Science, Kyoto University
8:20	<b>Overview of Ajou University</b> Prof. Hye-Young Jang Dean, Department of Energy Systems Research, Ajou University

**Group Photo (8:30-8:35)** Zoom ID: 446 879 1599 Code: 2020

All participants of the symposium are invited to open their cameras

---- Break (8:35 – 8:50) ----

Time	<b>Parallel Session 1</b>	<b>Parallel Session 2</b>
	Theme: Advanced energy utilization technology Zoom ID: 446 879 1599 Code: 2020	Theme: Process control and optimization of energy systems Zoom ID: 286 155 6567 Code: 2020
08:50	<b>Oral presentation</b>	
~	Moderator: Prof. Jae-Hyun Lee, Ajou	Moderator: Assistant Prof. Yutaka Okazaki, KU
10:05	<b>---- Break (10:05 – 10:15) ----</b>	
10:05	<b>---- Break (10:05 – 10:15) ----</b>	
~	<b>---- Break (10:05 – 10:15) ----</b>	
10:15	<b>---- Break (10:05 – 10:15) ----</b>	
10:15	Moderator: Assistant Prof. Masatsugu Takada, KU	Moderator: Prof. In-Hwan Lee, Ajou
~	Associate Prof. Neng Gao, Ningbotech	Research Prof. Qingyang Lin, ZJU



## Zhejiang - Kyoto - Ajou Joint Symposium on Energy Science

11:30

--	--

### Oral presentation session

Parallel Session 1

Zoom ID: 446 879 1599 Code: 2020

	Moderator: Prof. Jae-Hyun Lee, Ajou	
08:50	O01	Xuhan Zhang Zhejiang Univ., China
	<b>Solar fuel production based on photo-thermochemical reaction</b>	
09:05	O02	Yeong-Joo Cheong Ajou Univ., Korea
	<b>Sustainable Production of Hydrogen and Lactate from Biomass</b>	
09:20	O03	Samuel Matthew Dumlao Kyoto Univ., Japan
	<b>Study on the Influence of Gender Roles on Appliance Purchasing Behavior of Urban Middle Class in Developing Nations (GCOE-A)</b>	
09:35	O04	Latifa Seniorita Kyoto Univ., Japan
	<b>Developing Thermodynamic Models for Predicting Cold Flow Properties of Biodiesel: Solidification Behavior of Acylglycerols</b>	
09:50	O05	Ali Khaled Kyoto Univ., Japan
	<b>Three Dimensional Tomographic Isotope Imaging of 208Pb by Nuclear Resonance Fluorescence</b>	
10:05 ~ 10:15	<b>---- Break (10:05 – 10:15) ----</b>	
	Moderator: Assistant Prof. Masatsugu Takada, KU Associate Prof. Neng Gao, Ningbotech	
10:15	O06	Norihiro Hashimoto Kyoto Univ., Japan
	<b>Impartation of Bio-environmental Compatibility to Zirconium Alloy by the Function of Apatite Nuclei</b>	
10:30	O07	Guannan Jiang Zhejiang Univ., China
	<b>Experimental Study on The Transmission of Energy in A Vortex Tube</b>	
10:45	O08	Peng Yu Zhejiang Univ., China
	<b>Life cycle assessment of transformation from a sub-critical power plant into a poly-generation plant and comparison study of poly-generation and separate productions</b>	
11:00	O09	Jin Ge Zhejiang Univ., China



## Zhejiang - Kyoto - Ajou Joint Symposium on Energy Science

	<b>Modeling the slagging behavior in coal gasifier coupling with CFD simulation</b>	
11:15 ~	<i>O10</i>	Xinlu Han Zhejiang Univ., China
11:30	<b>A projection procedure to obtain adiabatic flames from non-adiabatic flames using heat flux method</b>	

### Parallel Session 2

Zoom ID: 286 155 6567 Code: 2020

	<b>Moderator:</b> Assistant Prof. Yutaka Okazaki, KU	
08:50	<i>O11</i>	Gogurla Narendar Ajou Univ., Korea
	<b>Self-powered artificial skin made of protein hydrogel for wearable and implantable electronics</b>	
09:05	<i>O12</i>	Umar Muhammad Ajou Univ., Korea
	<b>Stimuli Responsive Metal-Insulator-Metal Resonators</b>	
09:20	<i>O13</i>	Buma Carl Nkenku Animbom Ajou Univ., Korea
	<b>Synthesis of coupled 2D SnS<sub>2</sub>/TiO<sub>2</sub> heterojunction for photocatalytic remediation</b>	
09:35	<i>O14</i>	Bookun Kim Ajou Univ., Korea
	<b>Lateral Particle Migration in the Poiseuille Microflow by Colloidal Dynamics</b>	
09:50	<i>O15</i>	Runfa Tan Ajou Univ., Korea
	<b>Solution Synthesis and Activation of Spinel Copper Aluminate Photocathodes for Efficient Photoelectrochemical Performance</b>	
10:05 ~ 10:15	<b>---- Break (10:05 – 10:15) ----</b>	
	<b>Moderator:</b> Prof. In-Hwan Lee, Ajou Researcher Prof. Qingyang Lin, ZJU	
10:15	<i>O16</i>	Noeul Kim Ajou Univ., Korea
	<b>Hetero-junction Metal Oxide Coated ITO Nano-branches for Gas Sensors</b>	
10:30	<i>O17</i>	Kiran Murthy Kyoto Univ., Japan
	<b>Ligation of DNA Origami Nanostructures by Enzymatic and Chemical Approach</b>	
10:45	<i>O18</i>	Junqiang Shao Zhejiang Univ., China
	<b>Advanced Control Algorithm Focusing on Climate Auto-adaptation for Residential Air Conditioners</b>	



## Zhejiang - Kyoto - Ajou Joint Symposium on Energy Science

11:00	O19	Haiquan Dong	Zhejiang Univ., China
<b>Fe nanoparticles promote the biological conversion of feedstock gases CO<sub>2</sub> and H<sub>2</sub> to CH<sub>4</sub> production</b>			
11:15 ~	O20	Jinhui Fan	Zhejiang Univ., China
11:30	<b>Measurement of particle concentration and particle size distribution in gas-solid two-phase medium based on pulsed ultrasonic radar</b>		

### ---- Lunch Break (11:30 – 12:30) ----

Time	Parallel Session 1	Parallel Session 2
	Theme: Advanced energy utilization technology Zoom ID: 446 879 1599 Code: 2020	Theme: Process control and optimization of energy systems Zoom ID: 286 155 6567 Code: 2020
12:30	<b>Oral presentation</b>	
~	Moderator: Assistant Prof. Takeshi Yabutsuka, KU Associate Prof. Menglian Zheng, ZJU	Moderator: Associate Prof. Mclellan Benjamin, KU Research Prof. Liwu Fan, ZJU
13:45	<b>---- Break (13:45 – 13:55) ----</b>	
13:45 ~		
13:55	Moderator: Prof. Hyungwoo Lee, Ajou Prof. Linghong Chen, ZJU	Moderator: Assistant Prof. Chen Qu, KU Associate Prof. Nian Li, Ningbotech
15:10	<b>---- Break (15:10 – 15:20) ----</b>	
15:10 ~		
15:20	<b>Poster presentation</b>	
15:20 ~	Moderator: Assistant Prof. Jordi Cravioto, KU Research Prof. Yingchun Wu, ZJU	Moderator: Prof. Tomoaki Kunugi, ZJU Dr. Ning Chu, ZJU
17:12		

### Oral & poster presentation session

Parallel Session 1

Zoom ID: 446 879 1599 Code: 2020

<b>Oral presentation session</b>
Moderator: Assistant Prof. Takeshi Yabutsuka, KU Associate Prof. Menglian Zheng, ZJU



## Zhejiang - Kyoto - Ajou Joint Symposium on Energy Science

12:30	<i>O21</i>	Sheng Qi	Zhejiang Univ., China
	<b>Effects of gas preheat temperature on soot formation in co-flow methane and ethylene diffusion flames</b>		
12:45	<i>O22</i>	Junjie He	Zhejiang Univ., China
	<b>Morphology and nanostructure of flame-formed soot particles from incineration of typical municipal solid waste</b>		
13:00	<i>O23</i>	Jiaxing Song	Zhejiang Univ., China
	<b>Effect of thermal aging on waste plastic pyrolysis oil composition</b>		
13:15	<i>O24</i>	Hongxu Chen	Zhejiang Univ., China
	<b>Ozone Pollution of Hangzhou in Summer, Based on Online Observation</b>		
13:30	<i>O25</i>	Sheng Yang	Zhejiang Univ., China
	<b>Study on Thermal Stability of Sugar Alcohols Phase Change Heat Storage Materials</b>		
13:45	<b>---- Break (13:45 – 13:55) ----</b>		
~			
13:55	<b>Moderator:</b> Prof. Hyungwoo Lee, Ajou Prof. Linghong Chen, ZJU		
13:55	<i>O26</i>	Fanqi Kong	Zhejiang Univ., China
	<b>Quantification of multi-energy coupling effect in integrated energy systems</b>		
14:10	<i>O27</i>	Jie Sun	Zhejiang Univ., China
	<b>Simulation study on the local porosity optimizing design for flow battery electrode</b>		
14:25	<i>O28</i>	Xinru Wang	Zhejiang Univ., China
	<b>Mesoporous Adsorbents of High Kinetics for CO<sub>2</sub> Capture from Air</b>		
14:40	<i>O29</i>	Zhesong Huang	Zhejiang Univ., China
	<b>Selective ion adsorption arisen from rational asymmetric capacitive deionization cell design</b>		
14:55	<i>O30</i>	Jiahui Yu	Zhejiang Univ., China
	<b>Highly active UiO-66 derived ZrO<sub>2</sub> supported Ce/Ni nano-catalysts for CO<sub>2</sub> methanation</b>		
15:10	<b>---- Break (15:10 – 15:20) ----</b>		
~			
15:20	<b>Poster presentation session</b>		
	<b>Moderator:</b> Assistant Prof. Jordi Cravioto, KU Research Prof. Yingchun Wu, ZJU		
15:20	<i>P01</i>	Hyunwook Lee	Ajou Univ., Korea
	<b>Correlation between Redox Mediators and Singlet Oxygen in Lithium-Oxygen Batteries</b>		
15:25	<i>P02</i>	Peng Lin	Kyoto Univ., Japan
	<b>An impact of COVID-19 on energy consumption in Japan and energy system fitting to the new lifestyle (GCOE-B)</b>		
15:30	<i>P03</i>	Ali Khaled	Kyoto Univ., Japan
	<b>Theoretical study in the future shape of Japan's energy policy After Fukushima 2011 (GCOE-C)</b>		
15:35	<i>P04</i>	Yutaka Adachi	Kyoto Univ., Japan
	<b>Impartation of Hydroxyapatite Formation Ability to Bio-environmentally Compatible Chitosan Nanofiber</b>		





## Zhejiang-Kyoto-Ajou Joint Symposium on Energy Science

15:40 ~ 15:52	<b>Poster presentation group 1- Q&amp;A</b>	
15:52	P05 Liangchen Yue <b>Inhibition of N-Vanillylnonanamide in anaerobic digestion of lipids in food waste: Microorganisms damage and blocked electron transfer</b>	Zhejiang Univ., China
15:57	P06 Qinxuan Hu <b>A novel time-span input neural network for accurately MSW incineration boiler steam temperature prediction</b>	Zhejiang Univ., China
16:02	P07 Chenxi Wang <b>Research on sensitivity of ozone formation in Dongyang City Based on a 0-D box model</b>	Zhejiang Univ., China
16:07	P08 Shuting Zhang <b>Day-ahead Operation Scheduling Optimization of Multi-energy Flow System in an Industrial Park with Consideration of System Thermal Storage</b>	Zhejiang Univ., China
16:12 ~ 16:24	<b>Poster presentation group 2- Q&amp;A</b>	
16:24	P09 Encheng Feng <b>Data-driven analysis of secondary loop system of district heating system</b>	Zhejiang Univ., China
16:29	P10 Qing Ren <b>A Data Surrogate Mapping Model Construction Method for Power Plant Thermal System Based on Mechanism Simulation Extension</b>	Zhejiang Univ., China
16:34	P11 Hang Ma <b>Economic Analysis of Trigeneration Systems Considering Participations of Energy Storage</b>	Zhejiang Univ., China
16:39	P12 Zhenwei Yi <b>Post-combustion CO<sub>2</sub> capture and CO<sub>2</sub> mineral carbonation curing for concrete</b>	Zhejiang Univ., China
16:44 ~ 16:53	<b>Poster presentation group 3- Q&amp;A</b>	
16:53	P13 Xiang Sun <b>Study on performance of compressed air drying system driven by ejector refrigeration</b>	Zhejiang Univ., China
16:58	P14 Yujie Fu <b>Non-thermal plasma-modified Ru-Sn-Ti catalyst for chlorinated volatile organic compound degradation</b>	Zhejiang Univ., China
17:03	P15 Soosan Kim <b>Reduction of Polycyclic compounds and Biphenyls Generated by Pyrolysis of Industrial Plastic waste by Using Catalyst</b>	Ajou Univ., Korea
17:08 ~ 17:20	<b>Poster presentation group 4- Q&amp;A</b>	

### Parallel Session 2

Zoom ID: 286 155 6567 Code: 2020

<b>Oral presentation session</b>
<b>Moderator:</b> Associate Prof. Mclellan Benjamin, KU Research Prof. Liwu Fan, ZJU

## Zhejiang - Kyoto - Ajou Joint Symposium on Energy Science

12:30	<i>O31</i>	Niu Liu	Zhejiang Univ., China
	<b>Combining anion pillared hybrid ultramicroporous materials SIFSIX-2-Cu-i, GEFSIX-2-Cu-i and TIFSIX-2-Cu-i with Pebax/PEGDEM based membrane for efficient CO<sub>2</sub> separation</b>		
12:45	<i>O32</i>	Tianyu Zhang	Zhejiang Univ., China
	<b>Honeycomb-like hierarchical surface for condensation enhancement and droplet dynamic regulation</b>		
13:00	<i>O33</i>	Jiayi Zhang	Zhejiang Univ., China
	<b>Enhanced quenching boiling heat transfer and critical heat flux on wicking surfaces</b>		
13:15	<i>O34</i>	Yanjie Xu	Zhejiang Univ., China
	<b>Di-amine water lean solvents with high cyclic capacity and low viscosity</b>		
13:30	<i>O35</i>	Can Li	Zhejiang Univ., China
	<b>Multiparameters measurement of droplets with inclusions using rainbow refractometry</b>		
13:45 ~	<b>---- Break (13:45 – 13:55) ----</b>		
13:55	<b>Moderator:</b> Assistant Prof. Chen Qu, KU Associate Prof. Nian Li, Ningbotech		
13:55	<i>O36</i>	Xing Zhang	Zhejiang Univ., China
	<b>Kinetics of Catalytic Oxidation of Oxygenated Fuels on Pt/ZSM-5 Catalyst</b>		
14:10	<i>O37</i>	Mengyu Cao	Zhejiang Univ., China
	<b>Adsorption and reaction mechanism of toluene and ozone on MnO<sub>2</sub> catalyst in post-plasma catalysis</b>		
14:25	<i>O38</i>	Xueke Zhou	Zhejiang Univ., China
	<b>The relationship of morphology and catalytic performance of CeO<sub>2</sub> catalysts for reducing nitrobenzene to azoxybenzene under base-free condition</b>		
14:40	<i>O39</i>	Enujekwu Francis	Zhejiang Univ., China
	<b>New insights on the role of vacancy defect and nitrogen doping on gaseous adsorption and potential CO<sub>2</sub> reduction and water splitting over MoS<sub>2</sub> edges</b>		
14:55	<i>O40</i>	Xiaodan Lin	Zhejiang Univ., China
	<b>Experimental investigation of water droplet splashing with high-speed digital in-line holography</b>		
15:10 ~	<b>---- Break (15:10 – 15:20) ----</b>		
15:20	<b>Poster presentation session</b>		
	<b>Moderator:</b> Prof. Tomoaki Kunugi, ZJU Dr. Ning Chu, ZJU		
15:20	<i>P16</i>	Da Seul Kim	Ajou Univ., Korea
	<b>Microscale Patterning of Electrochromic Polymer Films via Soft Lithography</b>		
15:25	<i>P17</i>	Jong Sik Kim	Ajou Univ., Korea
	<b>All-hydrogel flexible supercapacitor having seamless interfaces using agarose hydrogel and activated carbon</b>		
15:30	<i>P18</i>	Hwan Sik Kim	Ajou Univ., Korea
	<b>THz phonon polariton of lead halide perovskite in conjunction with crystallization kinetics</b>		
15:35	<i>P19</i>	Seongju Ha	Ajou Univ., Korea



## Zhejiang-Kyoto-Ajou Joint Symposium on Energy Science

	<b>Highly efficient all-optical in-line modulators assisted by photothermal effect in monolayer graphene</b>		
15:40 ~ 15:52	<b>Poster presentation group 1- Q&amp;A</b>		
15:52	<i>P20</i>	Hae-Nam Choi	Ajou Univ., Korea
	<b>Synthesis of Rod-Coil Diblock and Rod-Coil-Rod triblock copolymers Containing Poly(3-hexylthiophene) from Coil-Type Macroinitiators</b>		
15:57	<i>P21</i>	Min-Ki Hong	Ajou Univ., Korea
	<b>In-plane graphene/h-BN heterostructure synthesis with controlled area fraction on a single crystal Ge substrate</b>		
16:02	<i>P22</i>	Rei Asekawa	Kyoto Univ., Japan
	<b>Selective excitation of infrared inactive lattice vibrational mode by mid-infrared free electron laser</b>		
16:07	<i>P23</i>	Hongtao Zhang	Zhejiang Univ., China
	<b>Molecular dynamics simulation of bubble nucleation in Al nanoparticles embedded n-decane</b>		
16:12 ~ 16:24	<b>Poster presentation group 2- Q&amp;A</b>		
16:24	<i>P24</i>	Yuxuan Yang	Zhejiang Univ., China
	<b>Facial synthesis of tailored mesopore-enriched hierarchical porous carbon from food waste for rapid removal of aromatic VOCs</b>		
16:29	<i>P25</i>	Fangfang Lou	Zhejiang Univ., China
	<b>Separation and identification of microplastics in environmental samples based on py-GC/MS</b>		
16:34	<i>P26</i>	Jiayu Li	Zhejiang Univ., China
	<b>Alkali Measurement Based on Flame Emission Spectrum</b>		
16:39	<i>P27</i>	Aibo Wei	Zhejiang Univ., China
	<b>Three-dimensional numerical simulation of cryogenic control valve using fluid-structure interaction approach</b>		
16:44 ~ 16:53	<b>Poster presentation group 3- Q&amp;A</b>		
16:53	<i>P28</i>	Yanhao Feng	Zhejiang Univ., China
	<b>Effect of moisture migration on ampacity of direct buried power cable based on a multi-physics numerical model</b>		
16:58	<i>P29</i>	Yuchen Jiang	Zhejiang Univ., China
	<b>Effect of HCl and SO<sub>2</sub> on Mercury Removal Performance Over a Ce-Cu/Al Catalyst in Low-Temperature Flue Gas</b>		
17:03	<i>P30</i>	Qadeer Akbar Sial	Ajou Univ., Korea
	<b>Core-shell CdSe@WO<sub>3</sub> nanoflakes for wearable aqueous supercapacitor with high energy density</b>		
17:08 ~ 17:20	<b>Poster presentation group 4- Q&amp;A</b>		

**Closing Ceremony (18: 30– 19:30)**

Zoom ID: 446 879 1599

Code: 2020

All participants are invited.

18:30	<b>Quiz Session</b>
19:00	<b>Closing Remarks</b>
	Prof. Xiang Gao Dean, College of Energy Engineering, ZJU
~	Prof. Hye-Young Jang Dean, Department of Energy Systems Research, Ajou University
	Prof. Keiichi N. Ishihara Dean, Graduate School of Energy Science, Kyoto University
19:30	