



**Europass
Curriculum Vitae**



Work experience	
Dates	1986 - 1990
Occupation or position held	Building Services Junior-Engineer
Main activities and responsibilities	Design and implementation of projects concerning internal heating systems, management of energy utilization, industrial and building energy consumptions;
Name and address of employer	Bucharest-Otopeni, Technical Equipment for Roads and Bridges Enterprise
Type of business or sector	Energy, Energy efficiency
Dates	Sept.1990-present
Occupation or position held	<ul style="list-style-type: none"> • Assistant - (1990-1998) • Senior Lecturer - (1998- 2001) • Associate Professor – (2001-2009) • Professor (2009-present), Vice dean of the Faculty (2008 - sept 2011) • Head of Thermo-Hydraulic Systems and Environment Protection Department (sept 2011- present)
Main activities and responsibilities	<p>Activities & teaching in the areas of:</p> <ul style="list-style-type: none"> • District Heating Systems • Cogeneration (large and small-scale Combined Heat and Power systems) • Heat transmission and distribution systems (Romanian and French Departments of the Faculty) • Different topics for the Energy Auditors Courses (ex. energy efficiency for buildings, energy analysis for thermal plants, substations and district heating networks, modern systems for heat transport with pre-insulated pipes etc.) • Research and design activity in the same fields: heat production, cogeneration (small scale or large scale combined heat and power systems), individual heating systems, district heating network systems. • Technical assistance for local authorities in the field of production of the heat, cogeneration, individual heating systems, heat transport and distribution. • Courses for professional formation of the energy auditors for buildings and installations
Name and address of employer	Bucharest, Technical University of Civil Engineering, Faculty of Buildings Services Engineering
Type of business or sector	Academic
Education and training	
Dates	5-8 march 2019
Title of qualification awarded	Skills in academic management
Principal subjects/occupational skills covered	Academic Management
Name and type of organisation providing education and training	Project co - financed by the European Social Fund through Operational Capacity Administrative Program 2014-2020

Dates	17.01.2011(not renewed authorization at 5 years)
Title of qualification awarded	Authorization no. 303 thermo-energetic auditor first degree
Principal subjects/occupational skills covered	Thermo-energetic audits for industrial consumers
Name and type of organisation providing education and training	National Authority for Regulation in Energy Sector (ANRE)
Dates	21-29 January 2008
Title of qualification awarded	Certificat de stage –course on ligne – (Formation permanente en Technologie de l'Information)
Principal subjects/occupational skills covered	Information technology for on-line courses
Name and type of organisation providing education and training	Agence Universitaire de la Francophonie (AUF) in collaboration with Technical University of Civil Engineering
Dates	14 -18.02.2005
Title of qualification awarded	Graduation certificate for technical expert for thermal and sanitary installations courses
Principal subjects/occupational skills covered	Projects controller and technical expert for thermal and sanitary installations
Name and type of organisation providing education and training	Technical University of Civil Engineering
Dates	4 -th June 2007, renewed in 2017
Title of qualification awarded	Authorization no. 07484 for projects controller and no. 07496 for technical expert
Principal subjects/occupational skills covered	Projects controller and technical expert for thermal and sanitary installations
Name and type of organisation providing education and training	Public Works and Territorial Development Ministry (MDRAP at present)
Dates	13 November 2006, renewed in 2011 and 2016
Title of qualification awarded	Authorization no. 00580 for energy auditor first degree (buildings and installations)
Principal subjects/occupational skills covered	Energy audits for buildings and installations
Name and type of organisation providing education and training	Public Works and Territorial Development Ministry (MDRAP at present)
Dates	Dec.1998
Title of qualification awarded	Ph.D. in Hydraulics, Diploma no.3772/5.05.1999
Principal subjects/occupational skills covered	Ph.D. in Technical Sciences - Hydraulics and Mechanics of Fluids
Name and type of organisation providing education and training	Bucharest Technical University of Civil Engineering, Faculty for Building Services Engineering
Dates	5 months 1988
Title of qualification awarded	Graduation certificate for post university courses for junior engineers
Principal subjects/occupational skills covered	Management activities in civil engineering sector
Name and type of organisation providing education and training	Industrial Buildings Ministry (MCInd)
Dates	October 1981- July 1986
Title of qualification awarded	Engineer Diploma
Principal subjects/occupational skills covered	Building Services Engineering courses
Name and type of organisation providing education and training	Technical University of Civil Engineering from Bucharest- Faculty for Building Services Engineering
Dates	Sept.1977 – July 1981
Title of qualification awarded	Graduation Diploma
Principal subjects/occupational skills covered	High School courses
Name and type of organisation providing education and training	Mathematics-Physics High School no. 3, Bucharest

Mother tongue(s)	Romanian									
Other language(s)	French, English									
Self-assessment	Understanding				Speaking				Writing	
<i>European level (*)</i>	Listening		Reading		Spoken interaction		Spoken production			
French	(C1)	Proficient user	(C1)	Proficient user	(C1)	Proficient user	(C1)	Proficient user	(C1)	Proficient user
English	(C1)	Proficient user	(C1)	Proficient user	(C1)	Proficient user	(C1)	Proficient user	(C1)	Proficient user
	(*) <i>Common European Framework of Reference for Languages</i>									
Social skills and competences	High experience in organizing complex activities for large students' groups Easy communication with people of different ages, nationalities and levels of professional training, Course organiser for people of different levels of professional training.									
Organisational skills and competences	<ul style="list-style-type: none"> Responsibilities in educational structural planning and teaching activity; Coordinator for GDF – Suez management staff training – First site Eastern Europe work school – Collaboration program in double partnership between GDF SUEZ - TUCB – Contract no. 164/07.01.2011, Ctr. 74/ 2013 , ENGIE RO-TUCB Ctr. 145/2016; Vice-president of the Romanian Energy Auditors Order (O.A.E.R) Vice-president of the Directory Council of Romanian Association of Building Services Engineers – Valahia Administrator of S.C LONG LIFE INSTALL S.R.L 									
Technical skills and competences	<ul style="list-style-type: none"> Experience in district heating, heat transmission and distribution system, energy efficiency; Author and co-author of research and applicative projects, different publications (books or articles) in district heating with or without cogeneration, heat transmission and distribution systems; Wide connection area within the specialists of the research, design and production units in the field of district heating; High experience in certification of buildings energy performance and energy efficiency; Over 800 projects verified and 30 technical expertises; 									
Computer skills and competences	Ability to work under the most well known tools designed for editing, graphics and WINDOWS applications (Word, Excel, Power Point, Visual Technical, Adobe-Photoshop, ACAD, Softs for Energy Audits etc.)									
Artistic skills and competences	Graduated of Musical School no.5 for piano. Several awards for district and municipal contests in playing piano									
Other skills and competences	Short Time Expert in formulation of skills for first cycle and Master (second cycle) graduated engineers, marked in RNCIS (National Register for Competences in Academic Studies) Expert in specialization programs evaluations in Civil Building Engineering Area of Studies (ARACIS)									
Driving licence	B category - dec. 1983									
Additional information	Country experience: Romania (since 1986), France (march-july 1993 and may-june 2001, Corsica 2006, Crete 2007, Rhodes 2008, Portugal 2008) Member of AUDIT Commission RENAR for EUROTOP DISTRIBUTION S.A, 21.II.2007 concerning the conformity of the management and quality system activity with SR 9001									
Publications (books)	<ul style="list-style-type: none"> Cogeneration et reseaux de chaleur – (french) PRINTECH Editor, 2002,ISBN 973-652-616-X 4 chapters in Guide for the engineers specialized in technical equipment in construction, ARTECNO Editor, Edition 2002 and Edition 2010, ISBN 973-85936-1-1 Ch. 11.1. Practical work of the heat transmission and distribution network system; Ch. 11.2. The hydraulic calculus of the heat transport and distribution network system; Ch. 11. 4. The mechanical calculus for the heat transmission and distribution network system; Ch. Heat exchangers (in the revised edition 2010) Courses in Energy Audit of existing buildings and their heating systems, Conspress Editor, ISBN 973-7797-13-2 Small-scale cogeneration -CONSPRESS Editor, 2009, 151 pages, ISBN 978-973-100-065-7 . Guide for District Heating - CONSPRESS Editor, 2009, 90 pagini, ISBN 978-973-100-066-4 Translation of Hydraulic Balancing of Heating and Cooling Systems VICTOR PYRKOV, sept 2006, 220 pag, Contract /2006 with Danfoss Analysis of a CHP Plant Operation for residential Consumers – Chapter: Sustainable Energy in the Built Environment - Steps Towards nZEB Part of the series Springer Proceedings in Energy, pp 77-86 									
Published papers (most representatives)	<ul style="list-style-type: none"> Frunzulică R,-The implications of implementing heat cost allocators and thermostatic valves for consumers) - Vol. of the Conference "Efficiency, comfort, energy conservation and protection of the Environment" – T.U.C.B, Bucharest, nov. 2004. Beldiman M., Frunzulică R., Toropoc M.-The implication of the binom tariff for the heat consumption in DH systems- Conference from Sinaia, octombrie 2005. 									

- Beldiman M., *Frunzulică R.*, Țoropoc M - Adaptation of centralized heat supply systems to the effects of disconnection of some consumers and to the modernization requirements- Vol. of the Conference "Efficiency, comfort, energy conservation and protection of the Environment" – T.U.C.B, Bucharest (edition XII), nov. 2005.
- *Frunzulică R.*, Damian A, - Energy consumptions analysis in a rehabilitated small-scale substation from a district heating system- 3rd IASME / WSEAS International Conference on Energy, Environment, Ecosystems and Sustainable Development (EEESD'07)- Agios Nikolaos, Creta, Grecia, 24-26 iulie 2007
- Sandu L, *Frunzulică R.*, Hasegan L, - Hydraulic stability in district heating pipe systems – Conference Timisoara, oct 2007
- *Frunzulică R.*, Damian A,- Small-scale cogeneration - a viable alternative for Romania- Energy, Environment, Ecosystems and Sustainable Development (EEESD'08)- Portugalia, Faro, iunie 2008
- *Frunzulică R.*, Toropoc M, Vartires A, - The implications of thermostatic valves and individual heat meters in DH systems from Romania - Energy, Environment, Ecosystems and Sustainable Development (EEESD'08) - Rhodos august 2008
- Toropoc M, *Frunzulică R.*, - Considerente tehnice si economice ale trigenerarii (Technical and economic considerations of trigeneration) – Proceedings of the Conference "Efficiency, comfort, energy conservation and environmental protection" (edition XIV-a), nov. 2008
- *Frunzulică R.*, Vartires A, Niculita L. -Aspecte Tehnice Și Economice Privind Repartitoarele De Costuri Din Sistemele De Alimentare Centralizată Cu Căldură (Technical and Economic Aspects of heat cost allocators in Central Heating Systems - Proceedings of the Conference "Efficiency, comfort, energy conservation and environmental protection" (edition XIV-a), nov. 2008
- Enache D, *Frunzulică R.*- POSIBILITĂȚI DE REDUCERE A CONSUMURILOR DE ENERGIE ELECTRICĂ ÎN SĂLILE DE SERVERE. Volumul cu lucrările Conferinței „Eficiență, confort, conservarea energiei și protecția mediului” (ediția a XIV-a), nov. 2008
- *Frunzulică R.*, Toropoc M, Uta L, - Modalitatea optimă si exemplu de selecție a soluției de cogenerare de mică putere pentru consumatorii de tip condominiu - Conferința „Eficiență, confort, conservarea energiei și protecția mediului” (ediția a XIV-a), martie 2010
- Toropoc M, *Frunzulică R.*, - ECONOMICAL Considerations concerning radiant heating systems – Conference CIEM nov. 2011- University POLITEHNICA Bucharest
- Gavrilă, C, *Frunzulică R.*, Radu V, - Bayesian Modeling of Reliability Management of Heating Boilers – 3rd Conference International Conference on MATHEMATICAL MODELS for ENGINEERING SCIENCE (MMES '12)- Paris, France, December 2-4, 2012
- R.A Baci, *Frunzulică R.*, Tarlea G.M – Considerations about software used in modeling and / or simulation of cogeneration plants – Romanian Journal of Civil Engineering, vol. 3 (2012) no. 2 ISSN 2068-3987, page 117-121
- Toropoc M, *Frunzulică R.*- The emissions of the combined heat and power (CHP) sources, - "International Scientific Conference - CIBv 2013, 25-26 oct. 2013, http://www.unitbv.ro/Portals/18/CIB/00_Program%202013.pdf, volum Indexat BDI
- *Frunzulică R.*, Damian A, Toropoc M.- Assessing the Thermostatic Valves Influence on Thermal Comfort in a Residential Collective Building -Proceedings of the 11th WSEAS International Conference on Environment, Ecosystems and Development EED'13, Brasov, Romania June 1-3, ID. 70106 – 151, <http://www.wseas.org/multimedia/conferences/2013/Brasov/Program.pdf>
- *Frunzulică R.*, Toropoc M,- The influence of thermostatic valves utilization and their impact on rehabilitated built environment - Proceedings of the 5th Romanian Conference on energy performance of buildings, ISBN 978-973-755-934-0, mai 2013, Bucuresti, Romania, 15. pag. 21-22, www.rcepb.ro
- Damian A, *Frunzulică R.*, - The influence of the use of renewable sources and heat recovery systems on the energy certification of a large commercial building - Romanian Revue for Civil Engineering, Vol.4 (2013), Nr.2, pag. 63-72, Indexare BDI ProQuest, INSPEC, EBSCO, Index Copernicus, Ulrich's, Journal Seek, www.rric.ro
- *Frunzulică R.*, Toropoc M,- Utilization de sources de cogeneration et leur impact sur l'environnement – Conferinta EENVIRO Sustainable Solutions for Energy and Environment, sept. 2013, Actes des communications de la SESSION FRANCOPHONE de EENVIRO 2013, www.eenviro.ro
- Zeghici M. R, Damian A, *Frunzulică R.*, Iordache F - Energy performance assessment of a complex district heating system which uses gas-driven combined heat and power, heat pumps and high temperature aquifer thermal energy storage, Revue Energy and Buildings – ISSN 0378-7788, 2013
- Gavrilă, C, *Frunzulică R.*, Patrascu, R.- Bayesian Networks for Prognosing and Managing the Properly Use of Thermostatic Valves - U.P.B. Sci. Bull., Series A, – Applied Mathematics and Physics, ISSN (print) : 1223-7027 / (on-line) 2286-3672, CNCSIS A, pag. 3-16, vol.76, Nr.1/ 2014 (factor de impact 0,192, 2014, indexată ISI), http://www.scientificbulletin.upb.ro/rev_docs_arhiva/rezdc2_704127.pdf, http://www.scientificbulletin.upb.ro/SeriaA_-Matematica_si_fizica_aplicate.php?page=indexare, <http://science.thomsonreuters.com/mjl/>, <http://admin-apps.webofknowledge.com>

- *Frunzulică R., Damian A, Colda I.* - Simulation model in TRNSYS of a small substation from Romania- Buletinul Stiintific al U.P.B. seria D: Mechanical Engineering, 2010, http://www.scientificbulletin.upb.ro/SeriaD_-_Inginerie_Mecanica.php
- *Frunzulica R, Damian A, Toropoc M.*- The arithmetic of heat cost allocators – Romanian Revue for Civil Engineering , Vol.5 (2014), Nr.3, pag. 235-242, Indexare BDI ProQuest, INSPEC, EBSCO, Index Copernicus, Ulrich's, Journal Seek, www.rric.ro
- *Frunzulica R, Damian A, Baciu R, Barbu C.* – Analysis of a CHP Plant Operation for residential Consumers – Chapter Sustainable Energy in the Built Environment - Steps Towards nZEB Part of the series Springer Proceedings in Energy, p 77-86
- *Patrascu R, Minciuc E, Frunzulica R, Damian A,*- Implementation of clean technologies in the context of sustainable development – Annals of the Academy of Romanian Scientist, Series on Engineering Sciences , Volume 6, No. 1/2014, ISSN 2066 – 8570
- *Bajenaru N, Damian A, Frunzulica R-* Evaluation of the energy performance for a nZEB office building under specific climatic conditions – Energy Procedia, 29 ian, 2016
- *Toropoc M., Gavrila, C, Frunzulica R, Toma P, D* - Mathematical modeling and simulation of a thermal system,- 25 - 28 august 2016, Constanta, Romania -The 8th edition of the International Conference "Advanced Topics in Optoelectronics, Microelectronics and Nanotechnologies, <http://dx.doi.org/10.1117/12.2243316>
- *G.Notton, E.Rebillout, C.Voyant, A.Damian, R.Frunzulica, V.Lazarov, I.Stoyanov* - "Solar potential for building integrated solar collectors: Application in Bulgaria, Romania & France" - publicat in volumele Conferintei internationale ELMA 2017, 1-3 Iunie, Sofia (Bulgaria)
- *A.Damian, R.Frunzulica, R.S Popescu, E.Rebillout, G.Notton,* - "Optimization of the solar thermal collectors integration in buildings for DHW production", publicat in volumele Conferintei internationale ELMA 2017, 1-3 Iunie, Sofia (Bulgaria)
- *S.M Toropoc, R. Frunzulica, D.P Toma* - Mathematical modeling and simulation of a thermal system using solar radiation as energy source, CIEM 2017
- *S.M Toropoc, R. Frunzulica* - Heat losses in district heating network in dynamic regimes, CIEM 2017
- *G.Marcus, V.Iordache, R. Frunzulica, F. Iordache* – Analysis of the efficiency of a cogeneration system with internal combustion heaters as a primary source and a hot water boiler as peak load system- Romanian Civil Engineering Magazine, vol. 9 (2018) no. 3 ISSN 2068-3987, page: 278-291

Annexes	Experience in other important and relevant programs:		
	Project	Position	Period:
	<p>1. Program ORIZONT 2000 - Solutions and evaluation criteria for the rehabilitation of district heating systems in order to ensure the system performances and reliability Contract 552/2000/A25/2001, Beneficiary MEC;</p> <p>2. Research Program MENER - Research and experimental study concerning thermal and hydrodynamics phenomena in monopipe heating systems with Venturi ejector Contract Nr. 127/2001, Subcontract ICPET CERCETARE S.A. Nr. 247/2000;</p> <p>3. Research Program AMTRANS- Theoretical and experimental study concerning district heating system utilization for district cooling Contract 2B 08./06.08.2002 Beneficiary MEC;</p> <p>4. Research Program AMTRANS – Research and experimental study concerning the energetic efficiency of heating installations for industrial buildings Contract 7B/2004, Beneficiary MEC;</p> <p>5. Research Program MENER - Improvement of heat utilization in order to obtain occupant's comfort under optimal economical conditions, Contract no. 460/2004, Beneficiary MEC;</p> <p>6. Research Program CEEEX – Modelisation of energy process characterized by building variable heat demands in district heating systems 2006-2008, ENERGYSYS Contract nr.X2C07/2006, Beneficiary MEC;</p> <p>7. Methodology for determination of the Energy efficiency performance of buildings – Contract no. 164/2006 MTCT and recast form of the methodology (2018 on going);</p> <p>8. Research Program CEEEX - Research concerning the establishment of most appropriate practical measures by promoting renewable energy in small communities and small or medium scale enterprises. Contr.P2-218/2006, 259/2006, Beneficiary UPB;</p> <p>9. Research Program CEEEX- Informatic system for monitoring and regulation of district heating systems so as for a correct payment for the heat consumption Contract 21-019/2007, Beneficiary MEC;</p> <p>10. Revision of Design Norms for District Heating-Romania – project 2007 150 XX HOR HOR financed by European Bank for Investments Beneficiary Ramboll Denmark, MDRT;</p> <p>11. The analyse of the possibilities for new and efficient heat production and distribution systems of the residential consumers.</p> <p>12. The evaluation of the functional state of the heat production and distribution systems of the residential consumers</p> <p>13. International Program – The utilization of renewable energy EnR - Corsica University and consortium;</p> <p>14. Overview of Energy Efficiency in Construction market in Romania and possible partners/developers in Romania; Beneficiary Rettost Norway;</p> <p>15. Conception of the heating (Revising of the I13 norms I13-2002 si I13/1-2002) Contract nr. 460/21.04.2010 , nr. 219/22.04.2010 nr. UTCB, Beneficiary MDRT;</p> <p>16. Guide for the efficient solutions using renewable energy in civil building engineering- Contract Contr. 459/21.04.2010, 218/22.04.2010 nr. UTCB, Beneficiary MDRT;</p> <p>17. The implications of thermal rehabilitation on district heating regulation systems – Swiss Founds Contract nr. 332 / 2010 (in U.T.C.B.), Convention nr. 601381/27.07.2010;</p> <p>18. Coordinator for GDF SUEZ DISTRIGAZ management staff training–The first site Eastern Europe work school – Collaboration program in double partnership between DISTRIGAZ GDF SUEZ, ENGIE Romania and Technical University of Civil Engineering – Contract no. 164/07.01.2011, no. 26/2013, and no.145/2016;</p> <p>19. Coordinator GDF SUEZ DISTRIGAZ management for supervisors engineers training courses – Contract no.79/2013;</p>	<p>Project coordinator</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Project coordinator</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Member of the District Heating experts RAMBOLL</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Local Consultant Rettost Norway</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Participant</p> <p>Course coordinator</p> <p>Course coordinator</p>	<p>2000-2004</p> <p>2000-2004</p> <p>2000-2004</p> <p>2004-2006</p> <p>2004-2006</p> <p>2006-2008</p> <p>2006-2007, 2017 on going</p> <p>2007-2009</p> <p>2007-2009</p> <p>Nov.2007-apr.2008</p> <p>2008-2011</p> <p>2004-2007</p> <p>2007-2010</p> <p>2010</p> <p>2007-2011</p> <p>2010-2011</p> <p>2010-2011</p> <p>2010-2015</p> <p>2013- 2017</p> <p>2013</p>

Annexes	Experience in other important and relevant programs:		
	Project	Position	Period:
	<p>20. Energy Efficiency centric projects- Energy Efficiency Project Identification in the towns of Galati - Romanian Consultant for LDK Consultants – funds from the European Investment Bank (march-june-2015); Beneficiary Local Authority of Galati</p> <p>21. Expert for rehabilitation of DH Systems in Oradea, Focsani, Bacau, Contract no. TA2018073 RO RP1 European Investment Bank.</p> <p>22. Energy Efficiency Improvement Through Renovation of Buildings- CONTRACT 7191267 /16. 04. 2019 UTCB-World Bank</p> <p><u>Participation as author or co-author for the following other projects (selection):</u></p> <ul style="list-style-type: none"> -Analysis and measures of hydraulic losses in the cogeneration district heating system in Bucharest (Contract 52-II/1991. Beneficiary RADET Bucharest). -Analysis and up-dating of the heat demand in order to elaborate the hydraulic and thermal regimes in the cogeneration district heating system in Bucharest (Contract 22/1991. Beneficiary RADET Bucharest) -Study regarding the opportunity of a raising pressure station in the cogeneration district heating system in Bucharest (Contract 22 phase II/1991. Beneficiary RADET Bucharest 1991). -Elaboration of an energy analysis guide for the thermal plants and substations (Contr. 35/1995. Beneficiary RADET Bucharest). -Study and analysis of the energy losses in the district heating system in Bistrita City (Contract 61/1995. Beneficiary Regia de termoficare Bistrita.). -Optimization and technological models for the rehabilitation of substations in the cogeneration district heating system in Bucharest (Contract nr.175/1996. Beneficiary RADET Bucharest.1991). -Theoretical study regarding the preinsulated pipes system behavior (Contract 33/1997. Beneficiary RADET Bucharest). Observations in formulation of Norm 029-002 concerning – -Conception, execution and exploitation of pre-insulated pipes in district heating. -Study concerning the energy efficiency of substations in different modernization stages (Contract nr.81/iunie1998. Beneficiary RADET Bucharest). -Rehabilitation of district heating network in Buzau (5000m) with preinsulated pipes in the area of 5 substations, Contract 666/2007 SC Confort - Beneficiary RAM Buzau -Over 160 Certifications for energy performances for apartments, buildings etc. in Bucharest and other towns; -Energy audits for several buildings in Bucharest and other cities; -Project for deviation of the District Heating distribution network for S.C Construct Aprodex, Str. Ion Garbea, Bucharest -Project for pre-insulated transmission network and connection to SS in District -Heating System for "Victor Gomoiu" Hospital, Bucharest; 	<p>Local Consultant</p> <p>Non-Key Expert</p> <p>Project Coordinator</p>	<p>2015</p> <p>2018-2019</p> <p>2019</p>