



इस अंक में:

- नाभिकीय नारे
- तकनीकी सत्र
- नाभिकीय आंकड़ा
- नाभिकीय समाचार
- शब्द कोश
- आपको मालूम है?
- विशेष आलेख
- नाभिकीय सामान्य ज्ञान

तैयारकर्ता एवं संपादक:

जाशी केबी ,
प्रभारी अधिकारी,
टीएलडी प्रयोगशाला
kbjashi@npcil.co.in

पुनरीक्षणकर्ता :

विजयकुमार बा
प्रभारी अधिकारी, ईएसएल
सदस्य, जन जागरूकता
समिति,
vijayb@npcil.co.in

एल. रिचर्ड ,
प्रशिक्षण अधीक्षक एवं
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जन जागरूकता समिति
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जारीकर्ता:

सतीश कुमार भा,
स्थल निदेशक,
कुडनकुलम न्यूक्लियर
पावर प्रोजेक्ट

प्रिय पाठकगण ,

परमाणु ऊर्जा एक मजबूत वैश्विक पुनरुत्थान का अनुभव कर रही है, जो स्वच्छ और विश्वसनीय बिजली की बढ़ती आवश्यकता के साथ-साथ कृत्रिम बुद्धिमत्ता आंकड़ा केंद्रों के द्रुत विस्तार से प्रेरित है। राष्ट्रों द्वारा स्थापना के प्रयासों में तेजी और पर्याप्त सार्वजनिक एवं निजी निवेश को आकर्षित करते हुए लघु मॉड्यूलर रिएक्टर (एसएमआर) इस दिशा में सबसे आगे हैं। इसके अलावा, उच्च निष्पादन कंप्यूटिंग में सहयोग संलयन ऊर्जा अनुसंधान में तेजी ला रही है, विश्व को निकट भविष्य में संभावित सफलता के करीब ला रही है। पढ़कर आनंदित हों...

अध्यक्ष, जन जागरूकता समिति

अक्टूबर 2025 के विशिष्ट बिंदु

1

केकेएनपीपी स्थल पर 33 और स्थल के बाहर 07 जन संपर्क कार्यक्रम आयोजित किए गए

2

1,792 घंटों का जन संपर्क, 5,349 लोगों से संपर्क

3

15,197 जन जागरूकता प्रकाशन वितरित किए गए

केकेएनपीपी का जलवायु परिवर्तन के न्यूनकरण में योगदान

जलवायु परिवर्तन आज वैश्विक पर्यावरण मुद्दों में सर्वाधिक महत्वपूर्ण है। नाभिकीय विद्युत न्यूनतम कार्बन प्रौद्योगिकियों में से एक है जो बढ़ती हुई आबादी एवं सामाजिक-आर्थिक विकास के लिए विद्युत उत्पादन करते हुए ग्रीन हाउस गैसों (जीएचजी) के उत्सर्जन (अधिकतर CO₂) में कमी लाती है। CO₂ के उत्सर्जन में कमी लाने में केकेएनपीपी का योगदान (दिनांक 31 अक्टूबर 2025 को) अब तक इस प्रकार है।



कुल उत्पादित विद्युत इकाई

120,736
मिलियन यूनिट



केकेएनपीपी द्वारा कुल CO₂ उत्सर्जन में कमी

103,712,402
टन

नोट: कोयले एवं नाभिकीय ऊर्जा के औसत जीवन चक्र ग्रीन हाउस गैस उत्सर्जन क्रमशः 888 एवं 29 (टन/गीगावाट घंटा) है।

Public Awareness e-Newsletter

Kudankulam Nuclear Power Project

October 2025

Issue –160

In this issue:

- Nuclear Slogan
- Technical session
- Nuclear Database
- Nuclear News
- Lexicon
- Did you know?
- Feature article
- Nuclear Trivia

Snap shot



A glimpse of **Asian openbill stork** near Anuvijay Township, Chettikulam.

Photography by
Shri Sunil V P
Chief Superintendent
KKNPP 1&2

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Ciconiiformes
Family:	Ciconiidae
Genus:	Anastomus
Species:	<i>A. oscitans</i>

Binomial name:

Anastomus oscitans

Source: en.wikipedia.org

Dear Readers,

Nuclear energy is experiencing a strong global resurgence, fueled by the growing need for clean and reliable power as well as rapid expansion of AI data centres. Small Modular Reactors (SMR) are at the forefront of this momentum, with nations expediting deployment initiatives and attracting substantial public and private investments. Besides, collaborations in high performance computing are accelerating fusion energy research, bringing the world closer to a potential breakthrough in the near future. Read on happily!

-Chairman, PA Committee



Spotlight of October 2025

1

33 on-site & 07 Off-site outreach programme organised

2

1,792 hours of Public Outreach, reached 5,349 people

3

15,197 PA Publications distributed



KKNPP's contribution to climate change mitigation

Climate change is the foremost global environmental issue today. Nuclear power is one of the low carbon technologies that can contribute to reducing greenhouse gas (GHG) emissions (mostly CO₂) while generating electricity for growing populations and socioeconomic development. KKNPP's contribution in preventing the CO₂ emissions till now (As on Oct 31, 2025) is given below.



No. of units of electricity generated **120,736** Million Units



Total CO₂ emissions avoided by KKNPP **103,712,402** Tonnes

Note: Average lifecycle GHG emissions for Coal & Nuclear is 888 & 29 (tonnes/GWh) respectively.

Asian Development Bank is prepared to support nuclear power

“

On nuclear energy, we see this technology as an important option for countries that want to shift away from coal and gas baseload and cut emissions. For the first time in our 60-year history, ADB is prepared to support nuclear power in our operations. Momentum is growing as new generations of large reactors and small modular reactors emerge. These offer flexible and scalable solutions, especially for countries with limited grid capacity or space for conventional plants.

”



Masato Kanda

President, ADB
(Asian Development Bank)

Source: Excerpts from Science and Technology in Society (STS) Forum dated Oct 05, 2025
www.adb.org



Public awareness Site visits:

Site visit commences with a visit to Nuclear Information Centre(NIC) and a structured lecture programme is conducted for about one hour on nuclear energy & safety features of KKNPP with relevance to the events at Fukushima and also addresses the queries mainly related to protection of marine organism and handling of waste. They are then taken to Model room for familiarization of site layout, simulator facility to visualize the functioning of safety systems and health physics training facility to understand the concept of radiation safety during normal operation & abnormal situation. Subsequently they are taken to the Intake structure and Desalination plant. This programme concludes with a feedback session. Two of the feedback received from the visitors are given in this section.



Public Voice

NUCLEAR POWER CORPORATION OF INDIA LTD
 நியூக்ளியர் பவர் கார்ப்பரேஷன் ஆப் இந்தியா லிமிடெட்
 (A GOVT OF INDIA ENTERPRISE)
 (ஒரு இந்திய அரசு நிறுவனம்)
KUDANKULAM NUCLEAR POWER PROJECT
 கூடங்குளம் அணுவின் திட்டம்

PUBLIC AWARENESS PROGRAM – FEED BACK FORM

விழிப்புணர்வு நிகழ்ச்சி - கருத்து பதிவுத் தாள்

Date / தேதி: 03/10/2025

Name of the Educational Institution / Village / Organization
கல்வி நிறுவனம் / கிராமம் / நிறுவனத்தின் பெயர்
செந்திரன் "சொடீய்யாங்கி" நிர்வாகம், வடமலை.

Name of KKNPP officials conducted the PA program
விழிப்புணர்வு நிகழ்ச்சியை நடத்திய கூடங்குளம் அணுவின் நிலைய அதிகாரிகளின் பெயர்
ஆர்.வி. கங்கனி, வினிகேசுரை

No. of participants பங்குபெற்றவர்களின் எண்ணிக்கை 28

Date and duration தேதி மற்றும் நேரம் 03/10/25 9.30 - 4.00

Visitors Feedback / பார்வையாளர்களின் கருத்துக்கள்

* எவ்வாறு மின்சாரம் உற்பத்தி செய்யப்படுகிறது என்பதை அறிந்தேன்.

* உணவு மூலம் பாதிக்கப்படுகிறது என்பதை அறிந்தேன்.

* பாதுகாப்பான முறையில் உணவு உற்பத்தி செய்யப்படுகிறது என்பதை அறிந்தேன்.

Signature / கையொழுக்கம் P. Kamirasan

Name / பெயர் எ. சண்முகேசன்

Designation / பதவி மாண்புமிகு மாண்புமிகு

NUCLEAR POWER CORPORATION OF INDIA LTD
 நியூக்ளியர் பவர் கார்ப்பரேஷன் ஆப் இந்தியா லிமிடெட்
 (A GOVT OF INDIA ENTERPRISE)
 (ஒரு இந்திய அரசு நிறுவனம்)
KUDANKULAM NUCLEAR POWER PROJECT
 கூடங்குளம் அணுவின் திட்டம்

PUBLIC AWARENESS PROGRAM – FEED BACK FORM

விழிப்புணர்வு நிகழ்ச்சி - கருத்து பதிவுத் தாள்

Date / தேதி: 15.10.2025

Name of the Educational Institution / Village / Organization
கல்வி நிறுவனம் / கிராமம் / நிறுவனத்தின் பெயர்
SPIC Nagar High School

Name of KKNPP officials conducted the PA program
விழிப்புணர்வு நிகழ்ச்சியை நடத்திய கூடங்குளம் அணுவின் நிலைய அதிகாரிகளின் பெயர்
A.V. Sathish
R. Velmail Murugan

No. of participants பங்குபெற்றவர்களின் எண்ணிக்கை 17

Date and duration தேதி மற்றும் நேரம் 15/10/2025 9.30 - 4.00

Visitors Feedback / பார்வையாளர்களின் கருத்துக்கள்

Clear demonstration, well explained about the working of Nuclear power plant we came to know about the Nuclear power plant very closely and its safety measures were amazing Interaction session made us to know more about this and was very useful for our future studies.

Signature / கையொழுக்கம் P. Devisala

Name / பெயர் P. DEVISALA

Designation / பதவி student



NPCIL Mission:

To develop nuclear power technology and to produce Nuclear Power as a safe, environmentally benign and economically viable source of electrical energy to meet the increasing needs of country.

Nuclear propulsion is a viable solution for maritime decarbonization

“Nuclear propulsion, once regarded as a distant prospect, is now under active consideration as a real option for the commercial maritime fleet. Shipyards and ship owners are exploring its potential and weighing the promise of virtually emission-free power against the complexity of introducing such a transformative technology into commercial fleets.”



Ole Christen Reistad

Senior Principal Researcher, DNV

Source: WNA & www.dnv.com dated 21 Oct 2025



Generation IV Nuclear Reactors

(Source: World Nuclear Association)

GIF reactor technologies

European programme from 2010:

ASTRID SFR was led by the French CEA, involved EDF and Areva, and was supported by a French government loan of €651 million. ASTRID was based on about 45 reactor-years of operational experience in France and would have been rated 400 to 600 MWe. It was expected to be built at Marcoule from 2020, with the unit being connected to the grid in 2025. The project was cancelled in 2019.

Allegro GFR is to be built in eastern Europe, and is more innovative. It is rated at 75 MWt and is being developed out of the EU GoFastR project. The ALLIANCE project (Preparation of Allegro – Implementing Advanced Nuclear Fuel Cycle in Central Europe) was then launched in 2012 to continue the elaboration of basic documents needed for high-level decisions and licensing of Allegro. The main nuclear parameters (power density, burn-up etc.) would be similar to those of the planned 2400 MWth GFR. The core built up from the initial fuel type (MOX) will be replaced by a core of ceramic fuel for the second half of Allegro operation. The Czech Republic, Hungary and Slovakia made a joint proposal to host the project, with French CEA support. A decision is expected in 2025/2026 as to whether the reactor move beyond conceptual study.

In mid-2013 four nuclear research institutes and engineering companies from central Europe’s Visegrád Group of Nations (V4) agreed to establish a centre for joint research, development and innovation in Generation IV nuclear reactors. The V4G4 Centre of Excellence was set up by scientific and research engineering company ÚJV Řež AS of the Czech Republic, the Academy of Sciences Centre for Energy Research of Hungary, Poland’s National Centre for Nuclear Research, and engineering company VUJE AS of Slovakia. It is focused on gas-cooled fast reactors such as Allegro.



Updated as on Nov 10, 2025

Source: <https://pris.iaea.org/PRIS>

OPERATIONAL REACTORS

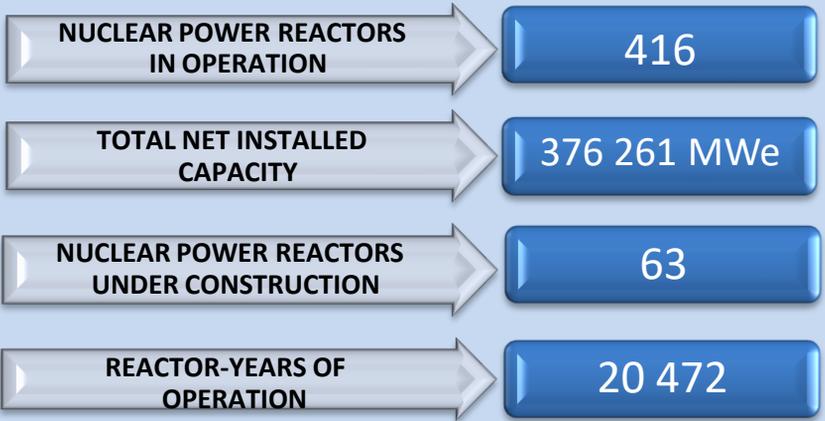
Country	MWe #	No. of Reactors
ARGENTINA	1641	3
ARMENIA	416	1
BELARUS	2220	2
BELGIUM	3463	4
BRAZIL	1884	2
BULGARIA	2006	2
CANADA	12714	17
CHINA	55320	57
CZECH REP	3963	6
FINLAND	4369	5
FRANCE	63000	57
HUNGARY	1916	4
INDIA	7550	21
IRAN	915	1
JAPAN	12631	14
KOREA	25609	26
MEXICO	1552	2
NETHERLANDS	482	1
PAKISTAN	3262	6
ROMANIA	1300	2
RUSSIA	26802	36
SLOVAKIA	2308	5
SLOVENIA	688	1
SOUTH AFRICA	1854	2
SPAIN	7123	7
SWEDEN	7008	6
SWITZERLAND	2973	4
UKRAINE	13107	15
UAE	5348	4
UK	5883	9
USA	96952	94
Total	376261	416

Net Electrical Capacity

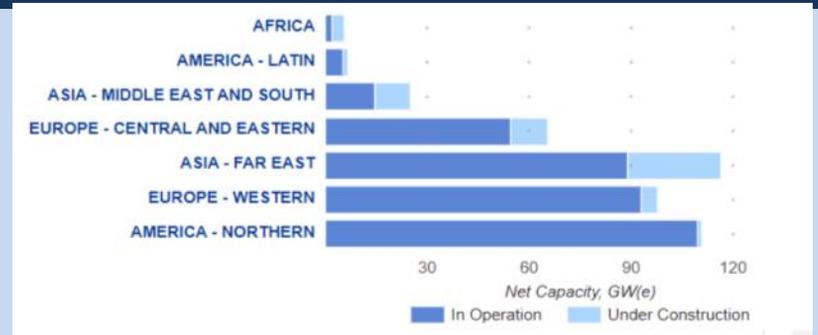
Source: <https://pris.iaea.org/PRIS>
www.nucnet.org



Current Status:



Regional Distribution of Nuclear Power Plants:



New connections to the grid: (Year 2025)

RAJASTHAN-7 (700 MW(e) *, PHWR, INDIA) on 17 March 2025

- ❖ Construction Start Date : 18 Jul, 2011
- ❖ First Criticality : 19 Sep 2024
- ❖ Grid Connection : 17 Mar 2025



* Gross Electrical Capacity

Source: www.nuclearasia.com



World's largest toroidal field coil box delivered Oct 17



A delivery ceremony has been held for the toroidal field magnet coil box - measuring 21 metres by 12 metres - at the Comprehensive Research Facility for Fusion Technology in Hefei, China. Shanghai Electric, in collaboration with the Institute of Plasma Physics, in July completed the design and delivery of the magnet cold test cryostat for the International Thermonuclear Experimental Reactor (ITER). The item, the largest transported, arrived at the construction site in Cadarache, southern France, following a 104-kilometre-long journey by road from the port of Berre-l'Étang, near Marseille. The goal of ITER is to operate at 500 MW (for at least 400 seconds continuously) with 50 MW of plasma heating power input.

Source: www.world-nuclear-news.org

India Developing 200 MW Compact Nuclear Reactors Oct 19



India is developing 200 MW nuclear power reactors, compact in size that can be deployed on commercial ships. Nuclear power is generated by causing nuclear fission to create heat that leads to electricity production. You can put the reactor wherever you want, even on a ship," a senior official said. He said scientists at the Bhabha Atomic Research Centre (BARC) are developing two nuclear power reactors of 55 MW and 200 MW that could be deployed at captive power plants used by energy-intensive companies such as cement manufacturers." These nuclear reactors are very safe and can even be used to power merchant navy ships," the official said.

Source: <https://defence.in>



ITER's Control Building completed Oct 03



Fusion for Energy - the ITER Organisation's European domestic agency - and its contractor Demathieu Bard have completed the Control Building for the International Thermonuclear Experimental Reactor at Cadarache in south-eastern France.

French engineering firm Demathieu Bard designed and constructed the building, which has a 3,500-square-metre footprint. The works lasted five years, totaling more than 200,000 person-hours. Thirty-five nations are collaborating to build ITER - the European Union is contributing almost half of the cost of its construction, while the other six members (China, India, Japan, South Korea, Russia and the USA) are contributing equally to the rest. Construction began in 2010 and the original 2018 first plasma target date was put back to 2025 by the ITER council in 2016. However, in June last year, a revamped project plan was announced which aims for "a scientifically and technically robust initial phase of operations, including deuterium-deuterium fusion operation in 2035 followed by full magnetic energy and plasma current operation".

Source: www.world-nuclear-news.org

Deadline extended to allow wider participation in BSR RFP Oct 08

Nuclear Power Corporation of India Ltd has added six months to the deadline for proposals from companies interested in using Bharat Small Reactors (BSR), and the names of six companies to have already formally submitted responses to Nuclear Power Corporation of India Ltd's Request for Proposals (RFP) have been revealed.



The six companies named in the latest update are Hindalco Industries Ltd, Jindal Steel & Power Ltd, Tata Power Co, Reliance Industries, JSW Energy Ltd and Adani Power Ltd. According to the NPCIL document, these companies have also identified probable sites for BSRs and submitted preliminary site reports for 16 sites. Five of these are in Gujarat, four in Madhya Pradesh, three in Odisha, two in Andhra Pradesh, and one each in Jharkand and Chhattisgarh. NPCIL said it has written to the state governments of Gujarat, Madhya Pradesh and Odisha "requesting to extend necessary support for site investigation activities and land & water allocation for setting up BSR".

Source: www.world-nuclear-news.org

Excavation works begin for Uzbekistan small modular reactor Oct 10



About 1.5 million cubic metres of soil will be excavated during the digging of a pit 13 m deep for the RITM-200N SMR being built in Uzbekistan. Uzbekistan's Uzatom said that 27 test and research boreholes have been drilled, with engineering surveys and design and preparatory works under way and a plan for design documentation to be submitted for review by the end of the year, with first concrete for the first SMR unit expected to be poured in March 2026. It is the first export order for Russia's SMR. The first land-based version is currently being built in Yakut, Russia, with the launch of the first unit scheduled for 2027. Rosatom says that its combination of active and passive safety systems means the SMR plants will achieve the highest possible safety standards.

Source: www.world-nuclear-news.org

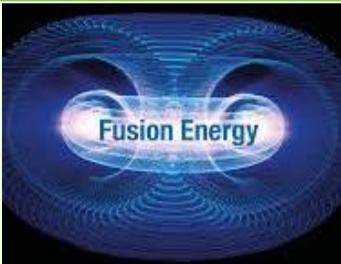


Nuclear Slogan



QUICK FACTS

Fusion entering implementation phase



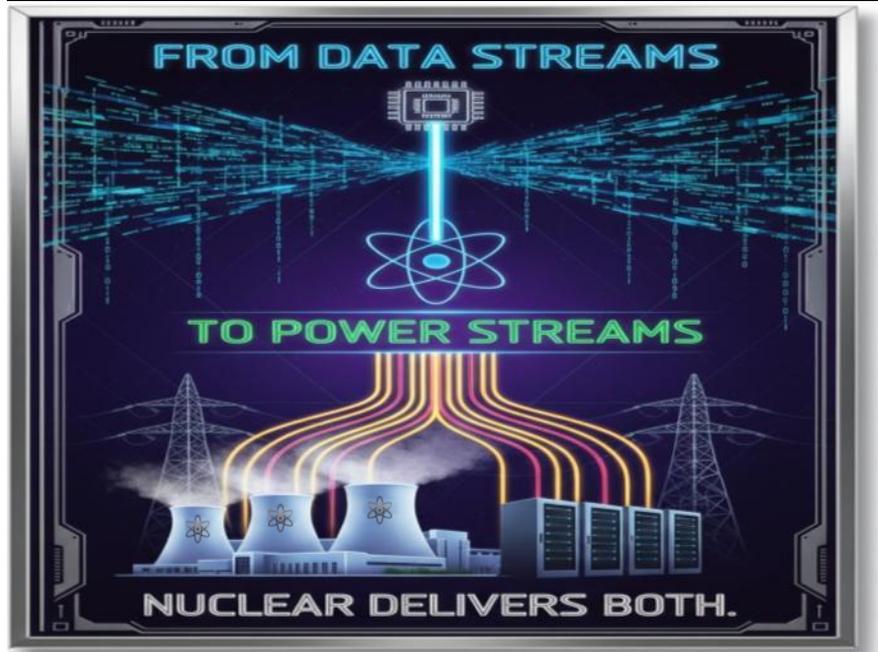
▀ Fusion energy is not advancing along a single, uniform trajectory.

▀ Instead, it is progressing through multiple parallel efforts, reflecting the diversity of technologies, approaches and regional contexts that are currently shaping the fusion industry.

▀ Today, nearly 40 countries operate active fusion programmes. Global private investment has surpassed USD10 billion

▀ There are more than 160 fusion devices now either operational, under construction or planned.

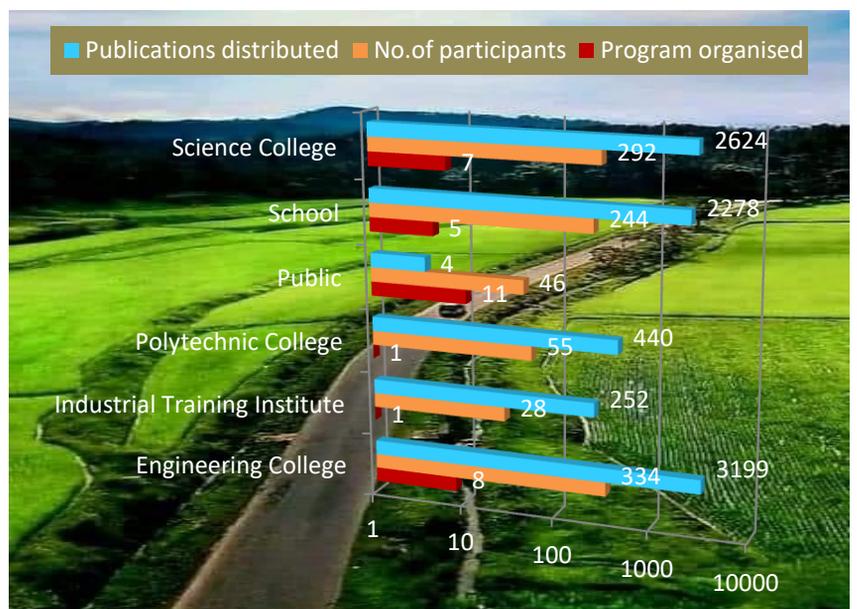
Source: IAEA, WNA



PA activity conducted at KKNPP Site

At site

As a part of public awareness programme, visits of Public from districts such as Tirunelveli, Kanyakumari and Tuticorin to KKNPP were organised. The visitors of KKNPP were provided with a detailed information on nuclear power generation and its safety principles.





Few glimpses from Site Visit

At site

**Government ITI, Pettai
(Oct 03)**



**Mar Ivanios College
(Autonomous),
Thiruvananthapuram
(Oct 04)**



**St.Thomas College,
Kozhencherry
(Oct 04)**



**PET Arts & Science College,
Vallioor
(Oct 06)**





Few glimpses from Site Visit

At
site

**GHSS Marayamuttom,
Thiruvananthapuram
(Oct 07)**



**Shri Swamy
Matric.Hr.Sec.School,
Ayothiyapattanam
(Oct 08)**



**Stella Mary's College of
Engineering, Aruthenganvilai
(Oct 08)**



**TDMNS College, T.Kallikulam
(Oct 09)**





Few glimpses from Site Visit

At
site

Loyola Institute of
Technology & Science,
Thovalai
(Oct 10)



SPIC Nagar Higher Secondary
School, Muthiahpuram
(Oct 13)



Government High School,
Elappavilai
(Oct 14)



Visit of Auditors, Chennai
(Oct 14)





Few glimpses from Site Visit

At
site

**Government Polytechnic
College,
Thiruvananthapuram
(Oct 15)**



**HQ Official with family,
Mumbai (Oct 16)**



**St. Joseph's Matriculation
Higher Secondary School,
Nagercoil
(Oct 16)**



**Adhiparasakthi Engineering
College, Melmaruvathur
(Oct 17)**





Few glimpses from Site Visit

At
site

**AAA College of Engineering
& Technology, Sivakasi
(Oct 23)**



**Students from Various
Government Higher
Secondary School,
Dindigul(Oct 24)**



**Arignar Anna College,
Aralvaimozhi
(Oct 25)**



**Dhanalakshmi Srinivasan
University, Tiruchirappalli
(Oct 25)**





Few glimpses from Site Visit

At
site

Noorul Islam Centre for
Higher Education, Nagercoil
(Oct 28)



Staffs from SRM TRP
Engineering College, Trichy
(Oct 28)



Sree Narayana College,
Kollam
(Oct 30)



TKM College of Engineering,
Kollam
(Oct 31)

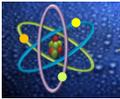


More on EAGLES-300

International project launched to accelerate the development of a fourth-generation lead-cooled reactor in Europe. The EAGLES Consortium, composed by ENEA and Ansaldo Nucleare for Italy, RATEN for Romania and SCK CEN for Belgium, has signed an agreement with the International Atomic Energy Agency (IAEA) to streamline and harmonize authorization processes at international level with a view to building the innovative EAGLES-300 reactor by 2039.

This will be a 350 MWe small modular reactor (SMR) designed to reduce construction time and contain investment costs. Thanks to passive safety systems that operate without human intervention or electrical power, and lead cooling that provides robustness and design simplification, EAGLES-300 will have high safety standards. A further distinctive feature will be the fuel management: the reactor will use MOX (Mixed Oxide Fuel), a mixture of oxides that will also include recycled materials and spent fuel from previous-generation power plants, with the aim of reducing radioactive waste and using resources more efficiently, increasing sustainability compared to traditional

Source: www.media.enea.it &
www.world-nuclear-news.org

**EAGLES-300**

EAGLES-300 is a lead-cooled Generation IV small modular reactor (SMR). The design referred to as the EU-SMR-LFR - was one of two lead-cooled fast reactor proposals selected by the European Industrial Alliance on Small Modular Reactors, a European Commission initiative to facilitate and accelerate the development, demonstration, and deployment of the first SMR projects in Europe in the early 2030s.

Key features of EAGLES-300:

High power output and grid flexibility

Around 350 MWe power

Suitable for industrial heat supply and hydrogen production

Modular design for lower construction investment, faster construction and flexible deployment

Optimised fuel management using MOX nuclear fuel, including recycled materials

Reducing radioactive waste and enhancing sustainability.

Four European nuclear technology organisations have launched the Eagles Consortium to develop and commercialise the EAGLES-300 next-generation lead-cooled small modular reactor with the aim of delivering a first demonstration by 2035.



EAGLES
Lead forward.

3D image of the Alfred reactor, to be built in Pitesti (Romania), one of the two demonstration prototypes that will be developed within the EAGLES-300 Consortium to qualify the entire project for subsequent commercialization.

See left



PA outreach programme conducted outside KKNPP:



As a part of PA outreach activity, Seminars, Workshop, Lectures and exhibitions were conducted at Educational Institutions and Organizations.

PA lecture at Lekshmiपुरam College of Arts & Science KK Dist.

Department of Biochemistry & Youth welfare committee of Lekshmiपुरam College of Arts & Science, Lekshmiपुरam, KK District organized a seminar on "Sustainable green energy for Nation's Development"

Date: Oct 08, 2025

Sh V PRABHAKARAN, Station Health Physicist, KKNPP 3&4 participated as Resource person and delivered Lecture during the Seminar.

No. of participants	250
Publications distributed	250

Date	Name of the Institution	No. of participants	Publications distributed
Oct 08	Lekshmiपुरam College of Arts and Science, KK Dist.	250	0
Oct 13	Rohini College of Engineering & Technology, KK Dist.	250	0
Oct 13	Rohini College of Engineering & Technology, KK Dist.	250	0
Oct 16	Kamaraj College of Engineering & Technology, Virudhunagar	600	0
Oct 17	The Little Flower School, KK Dist.	800	0
Oct 24 & 25	Jawahar Public School, Kerala	2000	6400
Oct 31	Mannaniya College of Arts and Science, Pangode, Kerala	200	0
Grand Total		4350	6400

Few glimpses

PA lecture at Lekshmiपुरam College of Arts & Science KK Dist. on Oct 08, 2025





PA Lecture at Rohini
College of
Engineering &
Technology
KK District

National level Technical Symposiums were organized at by Department of Electronics and Communication Engineering and Department of Artificial intelligence & Data Science, Rohini College of Engineering & Technology, KK District.

Date: Oct 13, 2025

Sh Prudhivi Sivaprasad, Scientific Officer-F, IT, KKNPP participated as Chief guest and delivered a Technical talk during the event.

A total of 500 students benefitted from the above events.

PA Lecture at Rohini College of Engineering & Technology
KK District on Oct 13, 2025



PA lecture at Kamaraj College of Engineering Virudhunagar

Kamaraj College of Engineering Virudhunagar organised a Seminar on "Role of Nuclear Energy on Climate Change".

Date: Oct 16, 2025

Sh Sundara Rajan P, Scientific Officer-F, ESL, KKNPP delivered a Technical Talk during the event. A total of 600 students participated in the event.

PA lecture at Little flower Matriculation HSS Pushpagiri KK Dist.

Sh A V SATHISH, OIC-Nuclear Information center, KKNPP participated as Chief guest during the 21st Annual day celebrations at Little flower Matriculation Higher Secondary School, Pushpagiri, KK District and delivered an motivational speech to the students during the function.

Date: Oct 17, 2025

About 800 students particip[ated in the event.

PA lecture at Mannaniya College of Arts and Science, Pangode

Sh A V SATHISH, OIC-Nuclear Information center, KKNPP delivered an awareness lecture to the students of Mannaniya College, Pangode, Kerala.

Date: Oct 31, 2025

About 200 students participated in the event.



Few glimpses

Outside KKNPP

PA lecture at Kamaraj College of Engineering Virudhunagar on Oct 16, 2025



PA lecture at Little flower Matriculation HSS Pushpagiri KK Dist on Oct 17, 2025



PA lecture at Mannaniya College of Arts and Science, Pangode, Kerala on Oct 31, 2025



Pangodu, Kerala, India 🇮🇳
Qx79+c54, Pangodu, Kerala 695609, India
Lat 8.763488° Long 76.967853°
Friday, 31/10/2025 10:55 AM GMT +05:30

Google

PA
exhibition at
Jawahar Public
School, Edava
Kerala

Jawahar Public School, Edava, Varkala, Thiruvananthapuram District organized a Science Exhibition 2025 (INICIO EXPO) at their campus .

Date: Oct 24-25, 2025

KKNPP participated in the exhibition and established a pavilion to display the models and exhibits to demonstrate the importance of Nuclear Energy for the development of our country. A total of 2000 students from nearby schools visited the KKNPP pavilion .

About 6400 PA publications were distributed to the students during the event.



Few glimpses

Outside
KKNPP

PA exhibition at Jawahar Public School, Edava Kerala on Oct 24-25, 2025





Did
you know?

Generation IV (Gen IV) Reactors are Going Online

► Gen IV reactors are a class of advanced fission designs focused on enhanced safety, sustainability, efficiency, and waste reduction.

► **First Commercial Operation:** China achieved a significant milestone by connecting the **HTR-PM** (High-Temperature Gas-cooled Reactor Pebble-bed Module at Shidaowan Nuclear Power Plant) to the grid, making it the **world's first Generation IV reactor** to enter commercial operation.



Shidaowan Nuclear Power Plant

► **Molten Salt and Fast Reactors:** Designs like **Molten Salt Reactors (MSRs)** and **Sodium-Cooled Fast Reactors (SFRs)** are gaining traction. They offer the potential to recycle used fuel, thereby significantly reducing the volume and half-life of nuclear waste.

► **New Fuel Types:** Research is rapidly progressing on advanced fuels, such as **TRISO fuel** (used in some SMR and Gen IV designs), which can withstand extremely high temperatures without melting, further increasing reactor safety.

Source: en.cnn.com.cn

More energy, lower emissions

Box 1: The importance of electricity

At present, fossil fuels are used to meet our energy requirements for transport, residential applications and to power industrial processes. Fossil fuels are also the dominant means of generating electricity, but other sources, including hydro, nuclear, solar and wind, are used too. To transition to a sustainable energy system all energy sectors will need to be decarbonized.

However, much of the focus to date has been on the electricity sector for several reasons:

The electricity sector is the most readily-decarbonized, as it provides the means to use non-fossil low-carbon energy (e.g. hydro, nuclear, wind and solar).

The electricity sector is the most readily-decarbonized, as it provides the means to use non-fossil low-carbon energy (e.g. hydro, nuclear, wind and solar).

Electricity is clean at the point of final use. This has two main advantages: improving air quality in urban areas; and centralising energy-related emissions (i.e. at power stations), making emissions regulation more straightforward.

About 20% of final energy consumption is in the form of electricity, but the generation of electricity is responsible for almost 50% of all energy-related emissions.

Despite the focus on electricity, limited progress has been made to date. In 2021, worldwide, 133% more electricity was generated from fossil fuels than 30 years earlier.





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Which nuclear process — fission or fusion — holds the key to powering tomorrow's world?

The Challenge with Fusion:

The major obstacle is technological maturity. Scientists are still working to achieve a sustained reaction that produces more energy than it consumes (net energy gain), and the engineering required to build a commercial-scale fusion power plant is immense.

The key to tomorrow's world lies in a multi-stage approach:

Near-Term (The Next 20-30 Years): Continued deployment of advanced nuclear fission (SMRs, Generation IV) to rapidly decarbonize global electricity grids while ensuring energy security.

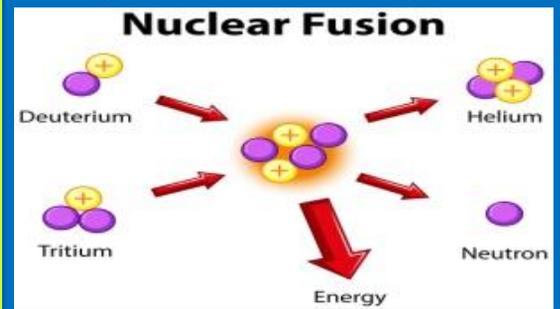
Long-Term (Mid-21st Century and Beyond): The successful commercialization of nuclear fusion to provide a virtually limitless, inherently safe, and globally sustainable energy future.

Fission is an established, reliable technology, but fusion offers the potential for virtually limitless, cleaner, and safer power that scientists are still working to commercialize.

Source:
www.sandiegobusiness.org,
www.iaea.org, www.epa.gov,
www.catf.us

The nuclear process that holds the key to powering tomorrow's world is widely considered to be **nuclear fusion**. While fission is the established technology that provides reliable, low-carbon power today, fusion is the future goal because it offers a theoretically inexhaustible, inherently safe, and environmentally cleaner energy source. Here is a breakdown of why fusion is the long-term goal and why fission remains essential in the near term.

The Case for Fusion: The Ultimate Clean Energy Nuclear fusion, the process that powers the Sun, involves combining two light atomic nuclei (typically hydrogen isotopes, Deuterium and Tritium) to form a heavier nucleus (Helium), releasing massive amounts of energy.



Key Advantage	Description
Fuel Abundance	The primary fuel, Deuterium, is extracted from ordinary water and is virtually limitless. The secondary fuel, Tritium, can be bred within the reactor from readily available Lithium.
Inherent Safety	Fusion reactors are inherently safe. Since the reaction requires extreme conditions (over \$100\$ million degrees Celsius) and a constant, precise fuel supply, any disruption causes the reaction to stop immediately and safely. A runaway chain reaction is physically impossible.
Minimal Waste	The main byproduct is Helium, an inert, non-radioactive gas. While fusion produces waste which has a much shorter half-life.
Immense Energy Density	Fusion releases significantly more energy per unit of fuel than fission or any chemical reaction, making it an incredibly efficient power source.