



इस अंक में:

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

तैयारकर्ता एवं संपादक:

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टीएलडी प्रयोगशाला
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जारीकर्ता:

अशोक भाटिया,
स्थल निदेशक,
कुडनकुलम न्यूक्लियर
पावर प्रोजेक्ट

प्रिय पाठकगण ,

अगस्त 2026 में भारत की नाभिकीय यात्रा में महत्वपूर्ण प्रगति देखी गई। सांसदों ने 2047 तक देश के 100 गीगावाट नाभिकीय ऊर्जा लक्ष्य का समर्थन करने के लिए घरेलू यूरेनियम परियोजनाओं के तत्काल विस्तार पर जोर दिया, जबकि शांति अधिनियम, 2025 के नियमों पर सार्वजनिक परामर्श ने नाभिकीय ढांचे के आधुनिकीकरण की दिशा में एक महत्वपूर्ण कदम चिह्नित किया। इन उपलब्धियों की श्रृंखला में, केकेएनपीपी के रिएक्टर 2 ने रिएक्टर 1 द्वारा स्थापित 638 दिनों के पिछले रिकॉर्ड को पार करते हुए 700 दिनों के निरंतर प्रचालन के एक नए स्टेशन रिकॉर्ड बनाया। ये उपलब्धियां भारत की बढ़ती नाभिकीय क्षमता, प्रतिबद्धता और प्रचालन उत्कृष्टता को दर्शाती हैं। जानकार बनें, जागरूक रहें।
अध्यक्ष, जन जागरूकता समिति



अगस्त 2026 के विशिष्ट बिंदु

1

केकेएनपीपी स्थल पर 43 और स्थल के बाहर 03 जन संपर्क कार्यक्रम आयोजित किए गए

2

1948 घंटों का जन संपर्क, 3,395 लोगों से संपर्क

3

19,370 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 अगस्त 2026 को) अब तक इस प्रकार है।



कुल उत्पादित विद्युत इकाई

133,140
मिलियन यूनिट



केकेएनपीपी द्वारा कुल CO₂ उत्सर्जन में कमी

114,367,137
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

August 2026

Issue –170

In this issue:

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

Snap shot



A glimpse of a **female Purple-rumped Sunbird** spotted near Anuvijay Township, Chettikulam

Photo Credit:
Sh Rathina Pandi
Senior Technician/H
MMU, KKNPP

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Aves
Order:	Passeriformes
Family:	Nectariniidae
Genus:	Leptocoma
Species:	<i>L. zeylonica</i>

Binomial name:
Leptocoma zeylonica

Source: en.wikipedia.org

Dear Readers,

August 2026 witnessed significant progress in India's nuclear journey. Parliamentarians emphasized the urgent expansion of domestic uranium projects to support the nation's **100 GW nuclear energy target by 2047**, while public consultation on the rules under the **SHANTI Act** marked an important step towards modernizing the nuclear framework. Adding to these milestones, **Reactor 2 of KKNPP established a new station record of 700 days of continuous operation**, surpassing the previous record of 638 days set by Reactor 1. These achievements reflect India's growing nuclear capability, commitment and operational excellence. Stay Informed, Stay Aware.

-Chairman, PA Committee



Spotlight of August 2026

1

43 on-site & 03 Off-site outreach programme organised

2

1,948 hours of Public Outreach, reached 3,395 people

3

19,370 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 Aug 31, 2026) is given below.



No. of units of electricity generated 133,140 Million Units



Total CO₂ emissions avoided by KKNPP 114,367,137 Tonnes

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

KKNPP reactors 1&2 are operated at full capacity

Reactor 2 established a new station record for continuous operation for 700 days, surpassing the previous record of 638 days held by Reactor 1. As on June 30, 2026, the KKNPP's first two reactors had generated 1,30,627 million units of electricity, thereby preventing 11.22 crore tonnes of carbon dioxide emissions into the atmosphere. KKNPP recently achieved the major commissioning milestone of 'Spillage to Open Reactor' in Reactor 3. Recently, the reactor pressure vessel (RPV) was successfully erected inside the reactor cavity of Unit-5. KKNPP had so far spent ₹155.33 crore on infrastructure development in the villages around the site under its corporate social responsibility programme..



Sh Ashok Bhatia
Site Director, KK Site

Source: www.thehindu.com dated 16 Aug 2026

79TH Independence Day
15 August 2025

He also highlighted the progress of Units 3–6, CSR initiatives, hospital services, CISF contribution and achievements of AECS Kudankulam. He urged everyone to uphold Safety First, Quality, Discipline, Integrity and Continuous Learning in the service of the nation.



Press
clippings



**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.

Role advanced nuclear could play in meeting growing demand for clean, reliable energy

"The need for more clean, reliable energy is clear, and this summit really opened my eyes to the breadth of technologies working towards this goal,"

It is exciting to see the role that advanced nuclear will play in this growing sector as well as the work being done to accelerate development, deployment and staffing of nuclear power systems in the coming years. NC State is very excited to be part of this."

**Steven Shannon**

Professor and department head of Nuclear Engineering, North Carolina State University, USA

Source: Excerpts from the Energy Summit 26 in Brazil, ne.ncsu.edu/ dated 27Aug 2026

*Technical session***Electricity and Energy Storage**

(Source: World Nuclear Association)

Pumped hydroelectric storage:

For off-river pumped hydro the paired reservoirs normally need to have an altitude difference of at least 300 metres. Abandoned underground mines have some potential as sites. In Spain's Leon region Navaleo plans a pumped hydro system in a former coal mine with a 710 m head and 548 MW output, feeding 1 TWh per year back into the grid. The project is anticipated to be commissioned in 2024.



Inside Alpiq's Navaleo pumped storage project in Spain
Source: www.waterpowermagazine.com

Unlike wind and solar inputs to a grid system, hydro generation is synchronous and therefore provides ancillary services in the transmission network such as frequency control and provision of reactive power. A pumped storage project typically has 6 to 20 hours of hydraulic reservoir storage for operation, compared with much less for batteries. Pumped storage systems are typically over 100 MWh stored energy. Pumped hydro storage is best suited for providing peak-load power for a system comprising mostly fossil fuel and/or nuclear generation at low cost. It is much less suited to filling in for intermittent, unscheduled generation such as wind, where surplus power availability is irregular and unpredictable.



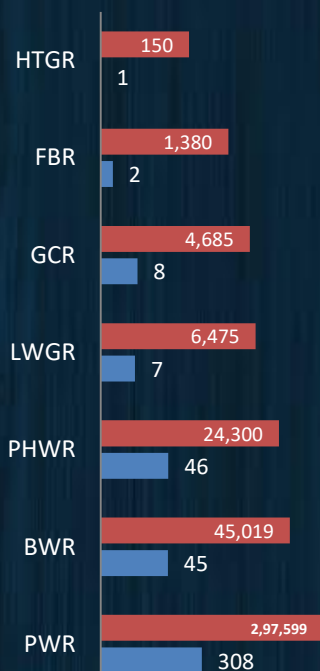
Updated as on Sep 09, 2026

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

OPERATIONAL REACTORS

■ Net electrical capacity
MW(e)

■ Number of reactors

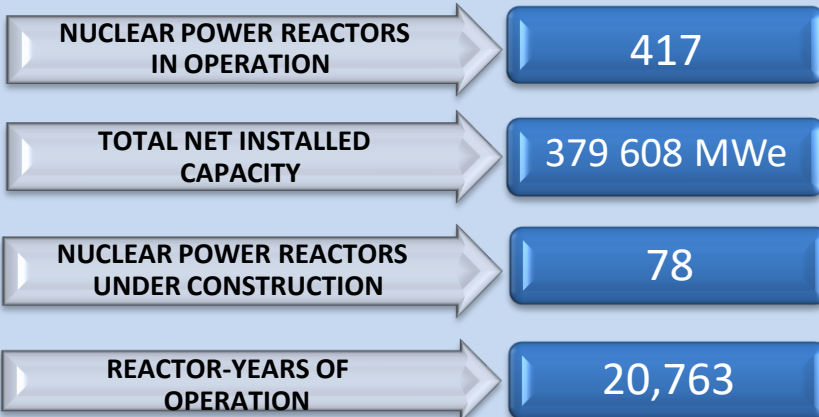


Type	Number of reactors	Net electrical capacity MW(e)
PWR	308	297 599
BWR	45	45 019
PHWR	46	24 300
LWGR	7	6 475
GCR	8	4 685
FBR	2	1 380
HTGR	1	150
Total	417	379 608

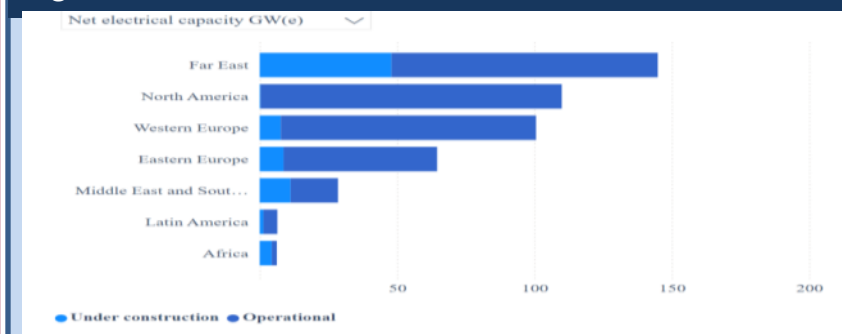
Source:

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

Current Status:



Regional Distribution of Nuclear Power Plants:



New connections to the grid: (Year 2026)

SANAO-1 (1117 MW(e), PWR, CHINA) on 12 March)

❖ Construction Start Date : 31 Dec, 2020
 ❖ First Criticality : 14 Feb, 2026
 ❖ Grid Connection : 12 Mar, 2026

TAIPINGLING-1 (1116 MW(e), PWR, CHINA) on 13 Feb)

❖ Construction Start Date : 26 Dec, 2019
 ❖ First Criticality : 03 Feb, 2026
 ❖ Grid Connection : 13 Feb, 2026

TAIPINGLING-2 (1116 MW(e), PWR, CHINA) on 04 Jul)

❖ Construction Start Date : 15 Oct, 2020
 ❖ First Criticality : 15 Jun, 2026
 ❖ Grid Connection : 04 Jul, 2026

Changjiang 3 (1110 MW(e), PWR, CHINA) on 01 Aug)

❖ Construction Start Date : 31 Mar, 2021
 ❖ First Criticality : 10 Jul, 2026
 ❖ Grid Connection : 01 Aug, 2026



India's Department of Atomic Energy has launched a public consultation on its draft rules and regulations under the 2025 legislation to modernise the country's nuclear legal framework and, amongst other things, enable limited private participation in India's nuclear sector. The new rules envisage the grant of a "single composite licence authorising the building, owning, operating, decommissioning" of nuclear power reactors (with the term "nuclear reactor" including "deuterium-tritium reaction based fusion reactors" as well as nuclear fission-based reactors).

Source: www.world-nuclear-news.org



President Vladimir Putin has set out the goals for Russia's nuclear energy sector. He said, domestically, "Russia plans to commission approximately 30 gigawatts of additional nuclear power capacity, including small nuclear power plants. This will not only replace power units that are gradually reaching the end of their service life but also significantly increase the overall capacity of domestic nuclear generation".

Source:

<https://world-nuclear-news.org/>



The expansion of uranium mining projects in India needs to be accelerated, a parliamentary committee has said. The Committee on Public Undertakings' comments came in a report covering the progress of India's planned nuclear energy expansion. It included the recommendations from an earlier report and the responses received from Nuclear Power Corporation of India Ltd (NPCIL) and the Department of Atomic Energy (DAE). The report notes DAE's assurance that by 2036 "Uranium Corporation of India Ltd (UCIL), Jaduguda plans to double the production by enhancing the existing mine capacity as well as setting up uranium mining projects in Jharkhand, Rajasthan and Chhattisgarh". The ambition is for India to reach a nuclear energy capacity of about 100 GW by 2047.

Source: <https://dae.gov.in> & www.world-nuclear-news.org

Radiant's 1 MWe microreactor - which is designed to be transportable - is making the journey from California to the DOME test bed at Idaho National Laboratory on the back of a truck. "We said we'd make a microreactor that is transportable by land, sea and air. We did. Kaleidos is



traveling more than 1,000 miles on a trailer bed," the company said. Radiant is to carry out a five-phase reactor development testing programme at the facility, progressing from zero-power criticality, through to generating full heat and power and running 150 continuous hours without operator assistance, a crucial milestone for proving its commercial readiness. Radiant signed an agreement with the US Air Force to deliver its first commercial microreactor to a military installation, Buckley Space Force Base, by 2028. "Radiant's testing campaign will ensure we deliver Kaleidos to Buckley Space Force Base by 2028," the company said.

Source: www.world-nuclear-news.org



Zero-power criticality testing for the eVinci microreactor has been successfully completed, Westinghouse Electric Company has announced. The test was completed at the Nevada National Security Site in the US, on Monday at 10:39 local time.

Westinghouse said the achievement was part of its "rapid product development philosophy, which combines testing, modelling, simulation and design improvements to accelerate technology maturation while reducing technical risk". The eVinci is a heat pipe-cooled microreactor which can produce up to 5 MWe with a 15 MWt core design. The TRISO-fuelled reactor core is designed to run for eight or more full-power years before refuelling, and the factory-built and assembled reactor can be shipped in a container to provide versatile, scalable energy for a variety of applications, including defence and in space.

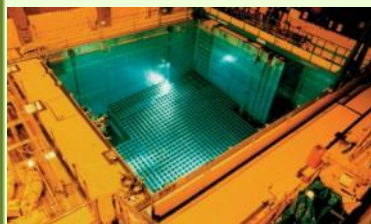
Source: www.world-nuclear-news.org



QUICK FACTS

Nuclear fuel is not “used up” completely.

❖ Even after leaving the reactor, **more than 90% of the spent fuel is still uranium**, and additional energy-bearing plutonium has been created inside the fuel.



❖ For 1 tonne of typical fresh LWR fuel enriched to ~4% U-235:

❖ U-235 initially $\approx$ 40 kg

❖ U-238 $\approx$ 960 kg

❖ After irradiation, roughly 10–15 kg U-235 may remain, depending strongly on burnup and reactor operation.

❖ About 10–12 kg plutonium may have been produced.

❖ About 40–50 kg fission products are generated.

❖ The vast majority of the original uranium therefore remains uranium.

Source: WNA, IAEA



Nuclear Slogan

Stable. Secure. Sustainable.
That's Nuclear.
Clean Energy. Strong Future. For Everyone.

KUDANKULAM NUCLEAR POWER PROJECT

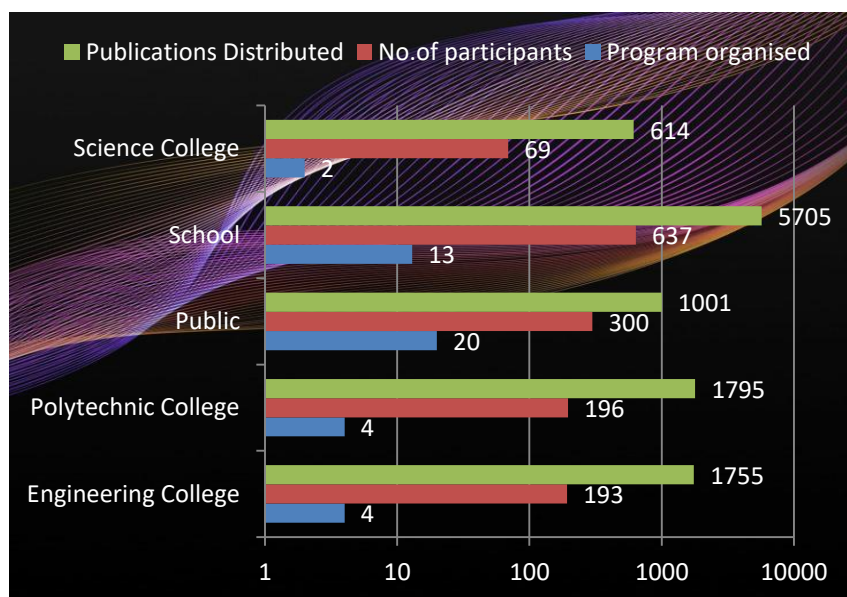
STABLE	SECURE	SUSTAINABLE
Reliable 24x7 power, in all seasons. A strong base for a strong nation.	Energy security for today and tomorrow. Less dependence, Greater independence.	Low carbon. Clean air. Protects our environment for future generations.

LOW CARBON EMISSIONS	HIGH ENERGY DENSITY	SMALL LAND FOOTPRINT	ADVANCED TECHNOLOGY	POWERING INDUSTRY, COMMUNITIES & LIVES
Nuclear Energy – For a Bright, Secure and Sustainable Future.		CHOOSE NUCLEAR. CHOOSE A BETTER TOMORROW.		

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 and also from Kerala 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

**Comorin International
School , Aralvaimozhi
(01 Aug)**



**Hi-Tech Polytechnic College,
Samugarangapuram
(03 Aug)**



**Sri Kumara Gurupara
Swamigal Arts College,
Srivaikuntam
(03 Aug)**



**Vivekananda College,
Madurai
(04 Aug)**





Few glimpses from Site Visit

At
site

**Amrita Vidyalayam
Sr.Sec.School , Tirunelveli
(05 Aug)**



**PSN College of Engineering
& Technology
(Autonomous), Tirunelveli
(06 Aug)**



**Sri Manakula Vinayagar
Engineering College,
Puducherry
(07 Aug)**



**Government Polytechnic
College, Konam
(07 Aug)**





Few glimpses from Site Visit

At
site

Govt. Hr. Sec. School ,
Kudankulam
(10 Aug)



Christhuraja Higher
Secondary School,
Palayamkottai
(11 Aug)



Stella Mary's College of
Engineering, Kanyakumari
(12 Aug)



Sankar Polytechnic College,
Sankarnagar
(13 Aug)





Few glimpses from Site Visit

At
site

**Comorin International
School , Kanyakumari
(14 Aug)**



**Govt. Hr. Sec. School
Kudankulam
(17 Aug)**



**Visit of NPCIL Employees,
Kudankulam
(18 Aug)**



**Christhuraja Higher
Secondary School ,
Palayamkottai
(18 Aug)**





Few glimpses from Site Visit

At
site

**John's Central School,
Anjugramam
(19 Aug)**



**Government Polytechnic
College, Tuticorin
(20 Aug)**



**Little Flower Public School,
Tirunelveli
(21 Aug)**



**Executive Trainees,
Kudankulam
(21 Aug)**





Few glimpses from Site Visit

At
site

**Trainees from NPCIL-KKNPP
& CIPET Skill Centre CSR
Beneficiaries, Radhapuram
(22 Aug)**



**Alphonsa Matriculation
Higher Secondary School,
Nagercoil
(24 Aug)**



**Kongunadu College of
Engineering & Technology
(Autonomous), Trichy
(25 Aug)**



**Vishwa Vidyapeeth Group of
Schools, Bengaluru
(27 Aug)**





Few glimpses from Site Visit

At
site

**Government Higher
Secondary School ,
Chettikulam
(28 Aug)**



**Members from Chettikulam
Pastorate, Chettikulam
(29 Aug)**



**Alphonsa Matriculation
Higher Secondary School,
Nagercoil
(31 Aug)**



More on SEALER



Swedish Advanced Lead-cooled Energy Reactor

A compact reactor design :

❖The SEALER only takes up 6x6 meters. It has an output of **55MW** and fuel residence time of 25 years. It has no overpressure system (1 atm), no exothermic reaction with structural materials nor water, and passive decay heat is removed by natural convection.

Long-life uranium nitride fuel

Fuels that have a higher uranium density can be used longer than the standard UO₂ fuel. Uranium nitride features 40% more uranium per volume unit, which equals a 40% longer life for the fuel.

Source: www.blykalla.com, IAEA



SEALER

SEALER is the acronym for Swedish Advanced Lead-cooled Energy Reactor. It is Blykalla's advanced reactor concept, developed from more than two decades of Swedish research on lead-cooled reactors. The commercial target is a compact **55 MWe** reactor. It belongs to the Lead-cooled Fast Reactor (LFR) family of advanced/Generation-IV reactor concepts.

Feature	SEALER
Developer	Blykalla, Sweden
Reactor type	Lead-cooled fast reactor
Reactor category	Advanced SMR/AMR
Commercial electrical output	55 MWe
Coolant	Liquid lead
Neutron spectrum	Fast
Fuel	Advanced uranium-based fuel
Main objective	Compact, reliable low-carbon power
Target users	Industry, data centres, grids

Lead coolant: This is the most important feature. Conventional reactors use water as coolant. SEALER instead circulates liquid lead around the fuel. Lead has a very high boiling point—about 1743°C—so it remains liquid at reactor operating temperatures without the high-pressure conditions required by water-cooled reactors. Lead is also relatively chemically unreactive with air and water. The Generation-IV International Forum identifies the high boiling point and low chemical reactivity of lead as important advantages of LFR technology. Lead is an excellent coolant, but it can be corrosive to structural materials at reactor operating conditions. However, Blykalla has developed a patented, aluminum alloyed steel exhibiting perfect corrosion resistance.

In May 2026, Blykalla submitted an application for a proposed **six-reactor, 330-MWe advanced reactor park** at Norrsundet.

See left

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

PA lecture at
PSN Engineering
College
Tirunelveli

As part of its ongoing public awareness and academic outreach efforts, Kudankulam Nuclear Power Project (KKNPP) participated in the National-level Technical Symposium "AGROBUILD", held at PSN Engineering College, Tirunelveli. The event was hosted by the college's Departments of Civil and Agriculture Engineering.

Date: August 5, 2026,

Shri G. Balakrishnan, Chief Engineer (Civil), KKNPP Units 3 & 4, graced the occasion as the Chief Guest. Addressing the gathering of engineering students and faculty, he highlighted the vital role of modern engineering practices, civil infrastructure in major industrial projects, and the nuclear energy sector. His presence reinforced KKNPP's commitment to encouraging young technical talent, enhancing public awareness, and promoting strong academic ties in the region.

No. of
participants 200



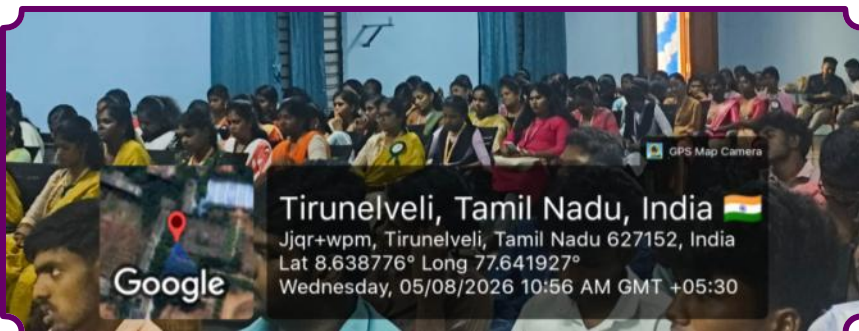
PA outreach programme conducted outside KKNPP:

Outside
KKNPP

Date	Name of the Institution	No. of participants	Publications distributed
Aug 05	PSN Engineering College	200	0
Aug 10-12	Junior Chamber International (JCI)	1600	8500
Aug 28	Nellai Engineering College	200	0
Grand Total		2000	8500

Few glimpses

PA lecture at PSN Engineering College
Tirunelveli On August 05, 2026



**PA Exhibition
during Jaycee
Week 2026 at
Tuticorin**

Kudankulam Nuclear Power Project (KKNPP) successfully participated in an exhibition during the "Jaycee Week 2026" inter-school and inter-college youth festival, held at Tuticorin.

Date: Aug 10-12, 2026

Organized by JCI Tuticorin, the event provided an impactful platform to engage with students and the public. A dedicated team of KKNPP officials was deputed across the three days to showcase informative exhibits, highlight nuclear power safety, and address public queries, strengthening community outreach and nuclear awareness in the region.

**PA lecture
at National
Engineering
college,
Tirunelveli**

Shri K.B Jashi, OIC, TLD Laboratory, KKNPP addressed the First-Year Induction Programme at Nellai College of Engineering on 28 August 2026.

Date: Aug 28, 2026

The inspiring session encouraged students to develop curiosity, discipline, technical competence, ethical values and a commitment to nation-building.



Few glimpses

Outside
KKNPP

**PA Exhibition during Jaycee Week 2026 at Tuticorin
during Aug 10-12, 2026**



No. of participants	Publications distributed
1600	8500

**PA lecture at Nellai Engineering College, Tirunelveli District
on Aug 28, 2026**



No. of participants	200
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KKNPP at "MSME CONNECT 2026", Virudhunagar

Kudankulam Nuclear Power Project (KKNPP) actively participated in "MSME CONNECT 2026," a two-day Mega CPSU Vendor Development Programme-cum-Industrial Exhibition held at Virudhunagar.

Date: August 27-28, 2026

The event aimed to promote the Public Procurement Policy for MSEs.

Shri Ashok Bhatia, Site Director, KKNPP, attended as Guest of Honour and highlighted vendor opportunities stemming from nuclear industry expansion, emphasizing product quality and alignment with the 'Atmanirbhar Bharat' vision.

During the technical session, Shri P. Arunkumar, DGM (C&MM), briefed vendors on NPCIL's procurement processes, quality standards, and expectations, followed by a live Q&A session. The session concluded with a vote of thanks delivered by Shri Manoj Shinde, DGM (C&MM), KKNPP.

No. of
participants

250



Few glimpses

KKNPP at "MSME CONNECT 2026", Virudhunagar
during August 27-28, 2026

Outside
KKNPP





*Did
you know?*

Plutonium story in an LWR

► The **plutonium (Pu)** story in an LWR is one of the most interesting nuclear-energy facts because Pu is both **produced and consumed inside the same reactor**.



► A typical LWR does not simply consume uranium.

► U-238 is converted into Pu-239, and the plutonium produced inside the reactor supplies roughly one-third of the reactor's heat through fission.

► More than half of the plutonium created can be burned inside the reactor before the fuel is discharged.

► This is an especially powerful way to explain **why “spent fuel” is not simply “waste.”** It still contains roughly **96% uranium and ~1% plutonium**, both of which have potential fuel value.

Source: WNA



Feature article

Nuclear Energy and Sustainable Development

Source: World Nuclear Association

The social pillar

Employment

Nuclear power plants can operate for over 60 years, creating long-lasting, high-paying jobs for people from a range of fields and educational backgrounds. Undertaking a nuclear power programme therefore represents a long-term investment in human capital.

Investment in capital-intensive projects tends to spill over into other industries and economic sectors. A modern gigawatt-scale nuclear power plant employs 500-1000 workers directly. But throughout both its construction and operation, it requires a complex supporting supply chain (e.g. construction, manufacturing and consultancy services), creating attractive indirect and induced employment opportunities.



During construction of a large, modern plant, thousands of workers may be onsite. At Hinkley Point C (pictured), over 8000 workers will be onsite during the peak of construction.

To be continued in Sep 2026



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Why is Lu-177 often described as a “theranostic” radionuclide?

Therefore:

β^- radiation $\rightarrow$ treats

γ radiation $\rightarrow$ allows imaging

That is the fundamental reason Lu-177 is so useful in theranostics.

Why imaging matters during therapy?

This allows physicians to evaluate whether the treatment is behaving as expected.

Lu-177 is particularly well suited because:

❖ The half life of Lu177 is 6.7 days. This allows preparation, transport and treatment over several days.

❖ Moderate beta-particle range Helps limit radiation to nearby tissue.

❖ It Can be attached to targeting molecules which enables molecular targeting. Thus, Lu-177 can simultaneously support treatment and monitoring, making it an important radionuclide in personalized targeted radionuclide therapy.

Source:

pubmed.ncbi.nlm.nih.gov,
www.pib.gov.in

Lu-177 is especially valuable because the same radionuclide can deliver therapeutic radiation to cancer cells while also emitting gamma photons that can be detected externally for imaging and treatment monitoring.

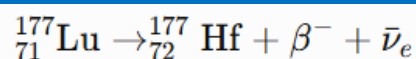
What happens after Lu-177 is administered?

Lu-177 is not normally given as free radioactive lutetium. It is attached to a targeting molecule that recognizes a particular biological target on cancer cells.

For example: Lu-177 + targeting molecule $\rightarrow$ Lu-177 radiopharmaceutical

The “therapy” part: β^- radiation:

Lu-177 undergoes beta-minus decay:



The emitted β^- particles (electrons) deposit their energy in nearby tissue. The beta particles have a relatively limited range in tissue, so radiation can be concentrated around the targeted tumour.

The “diagnostic” part: gamma photons

This is the particularly clever feature of Lu-177. After Lu-177 decay, it also produces gamma photons, including prominent emissions around 113 keV and 208 keV.

These photons can escape the body and be detected using a gamma camera or SPECT system.

See left