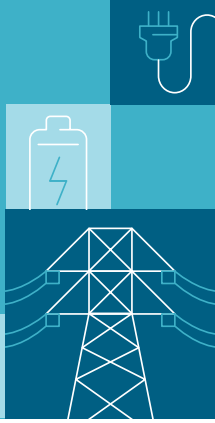


# Market Briefing Note

Further information on outcomes of Tender Round 5 for Long Duration Storage infrastructure



On 27 February 2025, AEMO Services announced the award of Long-Term Energy Service Agreements (LTESAs) in Tender Round 5 for Long Duration Storage (LDS) to three projects with a combined registered capacity of 1.03 GW and a storage capacity of 13.79 GWh – the largest LDS LTESA tender award to date.

The purpose of this market briefing note is to provide information on the successful LDS bids in Tender Round 5 and to outline how AEMO Services is making tender decisions in the long-term financial interests of NSW electricity customers.

One of the awarded projects is a Pumped Hydro Energy Storage (PHES) project which is expected to have a registered capacity of at least 800 MW and a storage capacity of around 11,990 MWh (i.e., equivalent to ~15h nominal storage duration). It is the first time that a PHES project has been awarded an LTESA.

Two other projects were awarded an LDS LTESA. Both are Battery Energy Storage Systems (BESS) which are expected to have a cumulative registered capacity of around 225 MW and combined storage capacity of around 1,800 MWh. They are both expected to be operational before 2030.

These were recommended to the Scheme Financial Vehicle (SFV) following the completion of a competitive tender process where the projects comprehensively demonstrated their value to New South Wales (NSW) electricity customers and benefits to their host communities.

None of the successful LDS Projects are connecting to new REZ infrastructure which would require an Access Right. Please refer to [Definitions](#) for further information on terms used throughout this note.

**Table 1: Successful Projects in Tender Round 5 – Long Duration Storage**

Project Name	Technology	MW/MWh
ACEN Phoenix PHES	PHES	800 MW / 11,990 MWh
Stoney Creek BESS	BESS (Li-ion)	125 MW / 1,000 MWh
Griffith BESS	BESS (Li-ion)	100 MW / 800 MWh

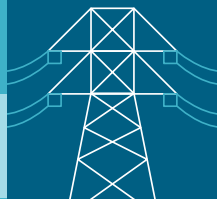
## Context and objectives of Tender Round 5

AEMO Services, as the Consumer Trustee, designs and implements competitive tenders under its mandate to recommend LTESAs that are in the long-term financial interests of NSW electricity customers. LTESAs incentivise the market to bring forward new energy infrastructure investment in NSW. Their design is intended to spur investment and lower the cost of financing while limiting cost exposure to NSW electricity customers.

Tender Round 5 was the fifth NSW Roadmap tender conducted by AEMO Services, and the third to offer LDS LTESAs. It was conducted in accordance with the 10-year Tender Plan set out in the [2023 Infrastructure and Investment Objectives Report](#).<sup>1</sup>

The [Tender Guidelines](#) provided an indicative tender size of 1 GW for Tender Round 5. LTESAs were awarded to LDS projects covering 103% of the indicative tender size. AEMO Services has the flexibility to recommend LTESAs above or below the indicative tender size where it has been determined to be in the long-term financial interests of NSW electricity customers.

<sup>1</sup> The final 2023 IIO Report, being the most recent, was published on 21 December 2023 and is available at the above link.



These projects are expected to contribute towards the minimum objectives for LDS set under the *Electricity Infrastructure Investment Act 2020* (EII Act). The Projects from this tender are expected to contribute a further 11% towards the minimum objective of 2 GW of long duration storage by 2030, leading to an overall 40% contribution towards the 2030 minimum objective including the outcomes of prior LTESA tenders. Further, the Projects from this tender are expected to contribute a total of 49% toward the minimum objective of 28 GWh by 2034 once all Projects are operational, leading to an overall 66% contribution towards the 2034 minimum objective including the outcomes of prior tenders. Together, the successful Projects are also expected to provide a positive contribution to improving potential reliability outcomes for NSW.

Further competitive tenders are scheduled to be run for LDS Projects which can contribute toward the minimum objectives for 2030 and 2034, and support reliability needs. The next LDS tender is expected to launch in Q2/2025, and additional tenders will be outlined in the upcoming 2025 IIO Report (scheduled for release in Q3/2025).

An overview of previous tender outcomes is shown in [Table 2](#).

Proponents should refer to the AEMO Services [website](#) for the latest information on current and previous Tender Rounds. Market Briefing notes on the outcomes of [Tender Round 1](#) (generation and LDS), [Tender Round 2](#) (firming), [Tender Round 3](#) (generation and LDS) and [Tender Round 4](#) (generation) are available online.

**Table 2: Sum of Maximum Capacity (MW) for generation and firming projects, Registered Capacity (MW) for LDS projects and Storage Capacity (MWh) for LDS and firming projects contracted to LTESAs across Tender Rounds**

Tender Round	Generation	Long duration storage	Firming
5	N/A	1,025 MW / 13,790 MWh	N/A
4	312 MW <sup>2</sup>	N/A	N/A
3	750 MW	524 MW / 4,192 MWh	N/A
2	N/A	N/A	1,075 MW / 2,980 MWh
1	1,390 MW	50 MW / 400 MWh	N/A
<b>Total</b>	<b>2,452 MW</b>	<b>1,599 MW / 18,382 MWh</b>	<b>1,075 MW / 2,980 MWh</b>

<sup>2</sup> Tender Round 4 awarded Hybrid Project has a storage capacity of 372MWh not captured in this table.

## Successful Projects in Tender Round 5

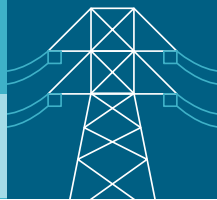
A number of competitive bids by LDS Projects were submitted for Tender Round 5. Other projects were assessed in the tender but were not awarded a LTESA as they did not demonstrate sufficient merit for NSW electricity customers.

The successful Bids scored well against:

- non-financial Merit Criteria – including a diverse range of social licence initiatives, a clear pathway to commercial operations and strong organisational ability to deliver the project, and either low or positive impact on curtailment of existing generators; and
- financial Merit Criteria – including competitive cost and limited cost exposure, high market benefits, and minimal or no departure from the pro-forma contract risk allocation. The successful Bids accepted the pro-forma LTESA's risk allocations.

Scoring against Merit Criteria is a key input considered by the Consumer Trustee and under the provisions of the EII Act, the Consumer Trustee may only recommend a Bid where:

- they are considered to be in the long-term financial interests of NSW electricity customers (having regard to the assessment as a whole); and
- the recommendation satisfies or is consistent with all relevant statutory requirements and duties.



Some of the successful Projects have longer lead times or carry early development risks which are allocated as a risk to be managed by each LTES Operator. The outcomes of this tender round demonstrate that the Consumer Trustee is willing to award to Projects throughout various stages of development, including earlier stage projects with higher delivery risk. The Consumer Trustee accepts this risk profile where it supports meeting the objects of the EII Act. The risk allocation in the LTESA mitigates some of this risk to NSW electricity customers.

The tender assessment considers specific electricity system benefits, including the potential for Projects to:

- Experience low or no curtailment in normal operation.
- Have minimal negative (or even positive) impacts on congestion for other projects.
- Provide essential system services and contribute to system strength.

In this tender, Projects could benefit where they were able to reasonably demonstrate the potential to:

- Provide a positive contribution to NSW network by relieving some congestion of nearby renewable plant and relieving certain stability limits.
- Contribute to improved system strength through grid-forming inverter capabilities or an ability to operate as a synchronous unit with quantified increase to fault levels and provision of inertia.
- Provide network service capabilities including frequency control, voltage control and system restart ancillary services.

The tender process also considers Projects' ability to have a positive impact on reliability by reducing modelled unserved energy. This uses an approach similar to modelling for AEMO's Electricity Statement of Opportunities and considers each Project's intended network location and duration.

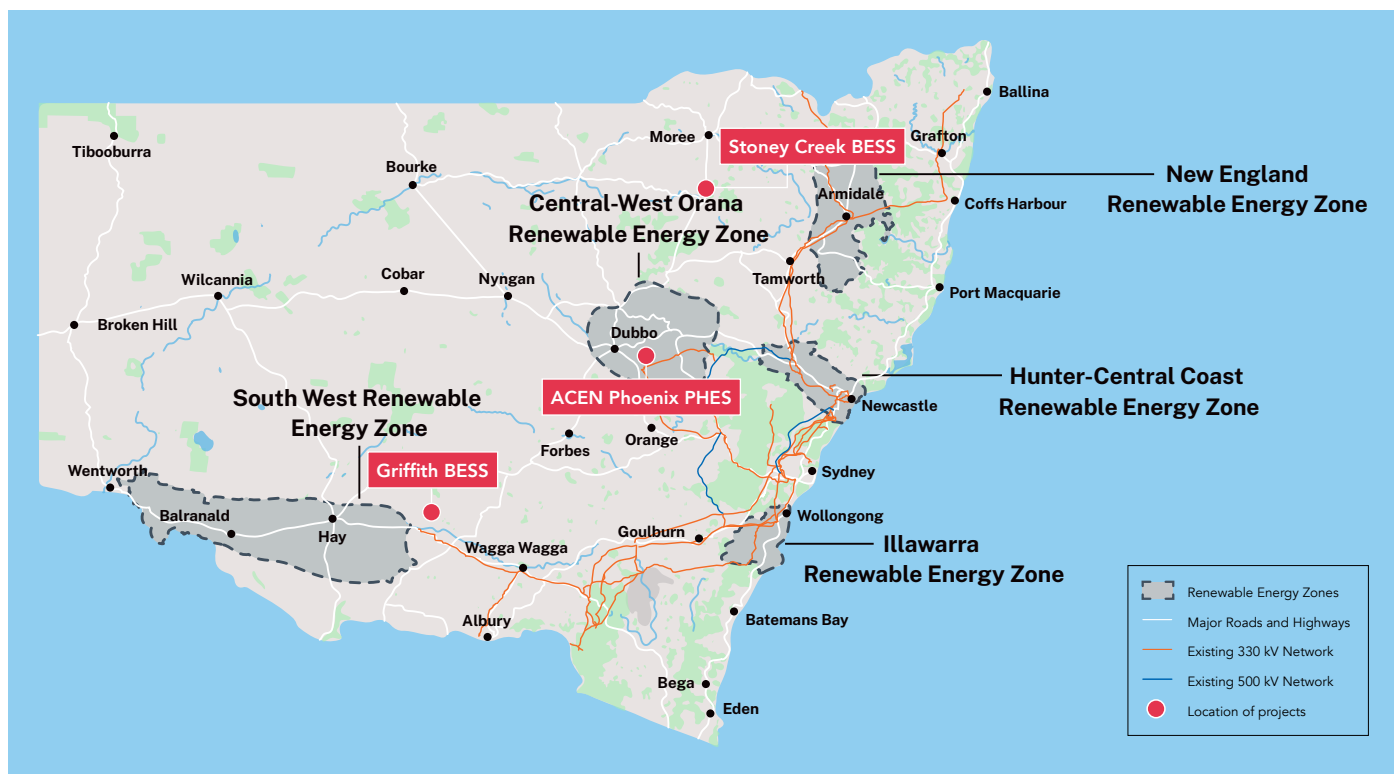
An overview of the successful projects is set out in [Table 3](#). Their locations are shown in [Figure 1](#).

**Table 3: Successful Projects in Tender Round 5 – Long Duration Storage**

Project Name	Proponent	Technology	Registered Capacity / Storage Capacity	Nominal storage duration
ACEN Phoenix PHES	ACEN Phoenix Pty Ltd	PHES	800 MW / 11,990 MWh	~15 hours
Stoney Creek BESS	Enervest Utility Pty Ltd	BESS (Lithium-ion)	125 MW / 1,000 MWh	8 hours
Griffith BESS	Ekus Energy Projects (Australia) Pty Ltd	BESS (Lithium-ion)	100 MW / 800 MWh	8 hours



Figure 1: Location of projects awarded LTESAs in Tender Round 5



## Pumped Hydro Energy Storage and upcoming LDS Tenders

In November 2024, the NSW Government legislated a further Long Duration Storage target for 2034, providing a strong signal that additional LDS infrastructure is required beyond 2030. The Consumer Trustee is agnostic to technology type and encourages any competitive and eligible Project to participate in future tender rounds.<sup>3</sup>

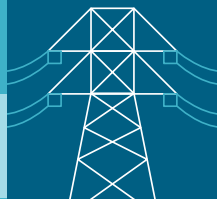
The next LDS tender round is expected to be opened in Q2/2025.

Short lead time LDS projects are encouraged to come forward and participate in the next LDS tender to contribute to the 1.2 GW/9.6 GWh needed to meet the 2030 minimum objective. Technologies with longer lead times, able to be delivered in NSW by 2034, are encouraged to participate in 2025 and future LDS tenders to help meet the 2034 minimum objective.

Further tenders will continue to be run to meet identified needs for LDS in NSW, as will be outlined in the upcoming 2025 IIO Report. AEMO Services encourages Projects to further progress, participate and bid in upcoming tenders.

Tender Round 5 featured the first award of an LDS LTESA to a PHES Project. Similar to the advanced-compressed air energy storage Project awarded an LTESA in Tender Round 3, this Project is expected to provide consistent long-term benefits to the NSW energy market. Its benefits are expected to include wholesale market price suppression, improved reliability outcomes (noting a particularly long storage duration), reducing curtailment of renewable generation, providing essential system services including frequency control, and providing a system strength contribution.

<sup>3</sup> The *Energy Amendment (Long Duration Storage and Investment) Act 2024* legislated an additional minimum objective of 12 GWh of long duration storage by 31 December 2033 to meet the reliability standard in NSW. This is in addition to the 2 GW and 16 GWh minimum objective by 31 December 2029 under the *Electricity Infrastructure Investment Act*, leading to a 28 GWh minimum objective by 2034.



## LTESA Prices

Financial Value Bids have become increasingly competitive over tender rounds. The winning projects used the flexibility of bid structure in a way that was forecast to lower the potential LTESA cost outcomes for NSW electricity customers.

There is significant flexibility embedded in the LDS LTESA which balances providing support to Proponents while unlocking value for NSW electricity customers. This includes reducing the contract term of an LTESA or excluding potential support in certain years. LDS LTESAs can also have varying bid prices by year and may be bid with a nominal dollars pricing structure. To be competitive in Merit Criteria 5 (Financial Value), a Financial Value Bid should be developed in a targeted way to suit the Proponent’s needs and minimise Forecast LTESA Costs to NSW electricity customers.

Successful Proponents demonstrated competitive bidding behaviour in setting their Annuity Cap and Net Revenue Threshold. Annuity Caps, which are the key pricing variable, were bid below their Net Revenue Threshold which implies the LTESA is used to guarantee a lesser amount than required to achieve their investment hurdles.

Some successful Proponents have provided bids that reduced the contract term from the maximum allowed. A Proponent may reduce the contract term or exclude Annuity Periods if they forecast sufficiently high operational revenue. This reduces the number of periods in which the SFV may be required to make top up payments and lowers potential LTESA cost outcomes for NSW electricity customers compared to a full contract term.

The awarded LTESAs include an LTESA that has its Annuity Cap and Net Revenue Threshold in nominal dollars. This means that the bid variables are not subject to escalation, reducing the SFV’s exposure to CPI risk.

**Average Equivalent Annuity Cap** - The simple average of the Average Equivalent Annuity Cap across the three successful Bids is presented in [Table 4](#). The Average Equivalent Annuity Cap is a representative value used for communicating bid prices and how these change between tenders. This value is representative of a bid price and not a cost outcome under an LTESA. It considers the maximum allowable contract term for a given technology rather than any reduced term. For example, if two BESS Bids had the same Annuity Cap but one bid for 10 Annuity Periods rather than 16, the calculated Equivalent Annuity Cap of the Bid with the shorter term would reflect this.

**Equivalent Annual Annuity** - The simple average of the Equivalent Annual Annuity across the three successful Bids is presented in [Table 4](#).

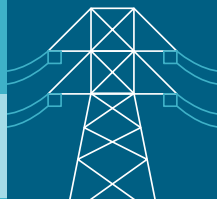
The Equivalent Annual Annuity is a representative value used for communicating potential costs of an LTESA to the SFV over the Project’s operational life and is shown here before considering the potential Market Benefits of the related Project. The Equivalent Annual Annuity is a useful metric for comparing Projects with different operational lifetimes and periods over which they can provide Market Benefits.

By default, bid prices escalate at the lesser of CPI or 3% per annum. Some of the awarded LTESAs are in nominal dollars and are not subject to change with CPI. The real 2024 dollars equivalent of the Fixed Price as shown in [Table 4](#) has been converted from nominal, based on an assumed CPI increase of 2.5% per annum.

**Table 4: Average Annuity Cap for awarded LDS LTESAs**

Project Name	Technology	Maximum LTESA Contract term	Average Equivalent Annuity Cap (real 2024)	Equivalent Annual Annuity (real 2024)
ACEN Phoenix PHES	PHES	40 years	~135,000/MW/year ~\$15,000/MWh/year	~95,000/MW/year ~\$10,000/MWh/year
Stoney Creek BESS	BESS	14 years		
Griffith BESS				

Note: the simple average (i.e., not weighted by Project MW or MWh) is used in the table above. Values have been rounded to the nearest \$5,000. Values provided per MW and per MWh cannot be scaled by the MW or MWh awarded across the successful Projects in T5 to calculate total costs.



## Assessment against Merit Criteria – MC5 Financial Value

AEMO Services used seven Merit Criteria, with each Merit Criteria given an individual weighting, to assess the quality of bids and make recommendations as the Consumer Trustee. See [Appendix 2](#) for the weightings across all Merit Criteria. This section provides insights into the assessment of MC5, which together with MC6 and MC7 have a combined weighting of 56%.

The Consumer Trustee uses the Tender Assessment Committee's assessment as a key input to its decision-making process, while retaining discretion to decide which Bids to recommend to the SFV. The Consumer Trustee may only recommend a Bid where it considers that the recommendation would be in the long-term financial interests of NSW electricity customers and complies with the relevant statutory requirements and duties.

MC5 is designed to assess the financial value of a Project and Bid as the net of the Project's impact in reducing energy prices in NSW ('Market Benefits'), and a Bid's forecast LTESA cost ('Forecast LTESA Cost'). Projects are rewarded under Market Benefits for lowering price volatility and NSW wholesale market costs, improving supply adequacy and reducing potential curtailment (also covered in MC1). All three successful Projects represent good value propositions for NSW electricity customers where their benefits exceed their forecast LTESA costs.

The present value of forecast market benefits is higher for the PHES Project than for the BESS. A key driver of this is its longer operational life and period over which to accrue benefits. The PHES has a storage duration beyond 8-hours which increases its Market Benefits per MW compared with only being 8-hours. For longer asset life technologies, this ability to accrue higher long-term benefits is important in offsetting potentially higher LTESA costs which are also spread over a longer contract term. While the present value of LTESA costs (on a total and per MW basis) for the BESS Projects is lower than for the PHES Project, all three Projects were competitive on an Equivalent Annual Annuity basis.

Market Benefits and forecast LTESA costs are modelled over several scenarios which were designed to reflect varying levels of volatility. Certain modelling levers, such as the use of more extreme demand profiles or thermal outage rates, are used to drive different volatility outcomes with changed supply adequacy and risks of unserved energy events. AEMO Services considers that volatility is often underestimated when performing traditional business-case energy market modelling and may use modelling levers to increase volatility in its central and high volatility scenarios for the purpose of assessment.

Projects could provide high Market Benefits, particularly in the high volatility scenario, where they are located in strong network locations and have longer storage durations. In a low volatility scenario, Projects are expected to earn less revenue and therefore have higher forecast LTESA cost, and also have less potential to create a market benefit through reducing volatility or high prices. In a high volatility scenario, the opposite is true with Projects being expected to earn higher revenue and have a lower forecast LTESA cost, and to have a greater ability to reduce energy prices. Generally, a Project that performed comparably well in any one scenario was also likely to do well in other scenarios.

[Table 5](#) outlines some insights from the MC5 assessment of LDS LTESA bids in Tender Round 5. This illustration does not represent an exhaustive consideration of financial value.



**Table 5: Characteristics of high performing bids in LDS LTESA assessment in Tender Round 5**

Key	Outcomes
Forecast LTESA Cost	<p>The successful projects were assessed as having low Forecast LTESA Costs relative to unsuccessful projects. Forecast LTESA Costs were assessed to be lower where bids had the following features:</p> <ul style="list-style-type: none"> <li>• Low Bid Prices (primarily low Annuity Cap and secondarily a low Net Revenue Threshold).</li> <li>• Excluded multiple Annuity Periods or bid a reduced Contract Term.</li> <li>• Took on CPI risk, reducing the SFV's cost exposure.</li> </ul> <p>These bid variables were assessed favourably where it led to a low Forecast LTESA Cost and Maximum Liability, and reduced cost and risk to the SFV.</p>
Bid Prices	<p>While competitive bids had a low Annuity Cap and a low Net Revenue Threshold, the Annuity Cap was seen to have a much greater impact on MC5 assessment outcomes. It is a key driver for minimising both Forecast LTESA Cost and Maximum Liability.</p>
Maximum Liability	<p>This metric considered the maximum potential from the SPV over the full LTESA term. As it considers the highest possible cost, it did not consider a Project's forecast Net Operational Revenue. Projects were assessed favourably if they had a competitively low normalised Maximum Liability.</p>
Storage duration	<p>Overbuilding the storage duration of the project to provide more than 8 hours of storage duration was assessed favourably. Additional storage is assessed to provide higher absolute benefits to customers. ACEN Phoenix PHES features an overbuild of the storage duration and provides the equivalent of ~15 hours of nominal storage duration. This increases its Market Benefits to NSW electricity customers.</p>
Earlier Commercial Operations Date (COD)	<p>An earlier COD was assessed favourably where the Project being available in the market earlier allowed it to capture more of the value arising from the modelled wholesale market volatility observed in earlier years. This led to higher forecast Net Operational Revenues in earlier years which could potentially put downward pressure on LTESA payments from the SFV. Additionally, earlier Project operation was assessed to be impactful to Market Benefits if it was forecast that there was good opportunity to provide wholesale price suppression.</p>
Network location	<p>Network location is a key driver of Market Benefits outcomes, and can be as important as additional storage duration for a Project. Being well located in a strong part of the network is expected to allow a Project's dispatch to flow to load centres, particularly during periods of highest need. Network location has previously been seen to be particularly important to modelling of the potential impact of a Project on reliability outcomes in NSW.</p>



## Appendix 1 – Definitions

Term	Definition
<b>Annuity Cap</b>	The Annuity Cap is a bid variable. It sets the maximum annuity that may be paid by the Scheme Financial Vehicle to the LTES Operation in a Financial Year of an Annuity Period. Annuity Cap is an important input in modelling of Forecast LTESA Cost but is not considered in isolation in determining the Financial Value of a Bid.
<b>Annuity Period</b>	A period of one financial year in which an LDS LTESA annuity product is available.
<b>Bid variables</b>	Input assumptions supplied by a Project in the MC5 Returnable Schedule. Includes Annuity Cap, Net Revenue Threshold, excluded periods and Contract Term.
<b>Forecast LTESA Cost</b>	The present value of forecast costs that may be incurred by the Scheme Financial Vehicle for an LTESA, weighted across a range of future potential scenarios.
<b>Maximum Liability</b>	Equal to the sum of the full Annuity Cap being paid in every Annuity Period over the Contract Term.
<b>Net Operational Revenue</b>	Intended to cover all revenue streams for the Project that are received by the LTES Operation, netted off against permitted costs. This would include gross revenue generated through the wholesale energy market, ancillary markets, network support, any future emerging markets and any other eligible contracts, minus certain costs including the cost of purchasing energy to generate these revenues.
<b>Net Revenue Threshold</b>	The Net Revenue Threshold is a bid variable. As a Project's Net Operational Revenue increases toward the Net Revenue Threshold, the annuity payment from SFV reduces below the Annuity Cap. If Net Operational Revenue exceeds the Net Revenue Threshold, a 50% revenue sharing percentage applies and a repayment to the SFV may apply. Repayments are capped at Historical Net Payments. A lower Net Revenue Threshold may reduce the Forecast LTESA Cost, all else being equal, but it had a lesser impact on Forecast LTESA Cost than minimising an Annuity Cap.

## Appendix 2 – Merit Criteria Weightings

Merit Criteria	Weighting
<b>MC1 – Impact on electricity system</b>	44%
<b>MC2 – Pathway to commercial operation</b>	
<b>MC3 – Organisational capacity to deliver Project</b>	
<b>MC4 – Community engagement, shared benefits and land use considerations</b>	
<b>MC5 – Financial value</b>	56%
<b>MC6 - Contract departures</b>	
<b>MC7 – Regional economic development</b>	

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This publication has been prepared using information available on 24 February 2025 and does not include any changes since the date of publication.