



TransGrid

**TransGrid Revenue Proposal
2018/19 – 2022/23**

Appendix N

KPMG:

**IT Benchmarking of
Australian Utilities**



2016 Utilities IT Benchmarking

Final Report - TransGrid

11 January 2017



Level 38 Tower Three
300 Barangaroo Avenue
Sydney NSW 2000
PO Box H67
Sydney NSW 1213
Australia

ABN 51 194 660 183
Telephone: +61 2 9335 7000
Facsimile: +61 2 9335 7001
DX 1058 Sydney
www.kpmg.com.au

Private and confidential

January 2017

Mr Stuart Barber
TransGrid
200 Old Wallgrove Road
Horsley Park NSW 2176

Dear Stuart,

2016 Utilities IT Benchmarking

Please find enclosed the 2016 Utilities ICT Benchmarking report in accordance with the agreed engagement letter between our organisations.

This report for is based on the data collected from you and other participants surveys between October and December 2016. Your results are compared to group averages for each of the metrics with accompanying comments on the survey data and the number of participants within the group as appropriate.

Should you have any question or wish to provide feedback on this engagement, please do not hesitate to contact me.

Yours sincerely,

Josephine Meneses
Partner

Important Notice

This report has been prepared as outlined in the Scope Section. The services provided in connection with this engagement comprise an advisory engagement, which is not subject to assurance or other standards issued by the Australian Auditing and Assurance Standards Board and, consequently no opinions or conclusions intended to convey assurance have been expressed.

No warranty of completeness, accuracy or reliability is given in relation to the statements and representations made by, and the information and documentation provided by you and the survey participants consulted as part of the process.

KPMG have indicated within this report the sources of the information provided. We have not sought to independently verify those sources unless otherwise noted within the report.

KPMG is under no obligation in any circumstance to update this report, in either oral or written form, for events occurring after the report has been issued in final form.

The findings in this report have been formed on the above basis.

Third Party Reliance

This report is solely for the purpose set out in the Scope Section and for your information, and is not to be used for any other purpose or distributed to any other party that is outside the agreed mechanisms in the engagement letter for services dated 8 September 2016.

This report has been prepared at your request in accordance with the terms of KPMG's engagement contract dated 8 September 2016. Other than our responsibility to you, neither KPMG nor any member or employee of KPMG undertakes responsibility arising in any way from reliance placed by a third party on this report. Any reliance placed is that party's sole responsibility.

The contents of this report have been redacted and do not represent our conclusive findings, which will only be contained in our final detailed report.



Glossary

ACT	Australian Capital Territory	NEM	National Electricity Market
AEMC	Australian Energy Market Commission	NER	National Electricity Rules
AEMO	Australian Energy Market Operator	NMI	National Metering Identifier
AER	Australian Energy Regulator	NSW	New South Wales
Capex	Capital Expenditure	NT	Northern Territory
CIO	Chief Information Officer	Opex	Operating Expenditure
CIS	Customer Information System	OT	Operational Technology (e.g. SCADA)
CPI	Consumer Price Index	PTRM	Post Tax Revenue Model
CRM	Customer Relationship Management	PV	Photovoltaic
Dep	Depreciation	QLD	Queensland
DNSP	Distribution Network Provider	RFM	Roll Forward Model
EAPI	Energy Architecture Performance Index	RINS	Regulatory Information Notices
ERP	Enterprise Resource Planning	SA	South Australia
FTE	Full Time Equivalent	SCADA	Supervisory Control and Data Acquisition
FY	Financial Year	TNSP	Transmission Network Provider
ICT	Information & Communications Technology	Totex	Total Expenditure (Opex + Capex)
IT	Information Technology	VIC	Victoria
MFD	Multi-Function Display	WA	Western Australia
MTFP	Multilateral Total Factor Productivity	WACC	Weighted Average Cost of Capital
MW	Megawatt	WEF	World Economic Forum

Contents

	Page
Executive summary	5
➤ Overview	6
➤ Benchmarking results	7
➤ A Final Word	10
Scope, approach and Participants	11
State of the Industry	15
➤ AER Benchmarking	16
➤ Industry Trends	18
Presentation of benchmarks	21
Corporate ICT Benchmarks	25
➤ Strategic Issues	72
Regulatory Technology Benchmarks	83
➤ TNSP Results	84

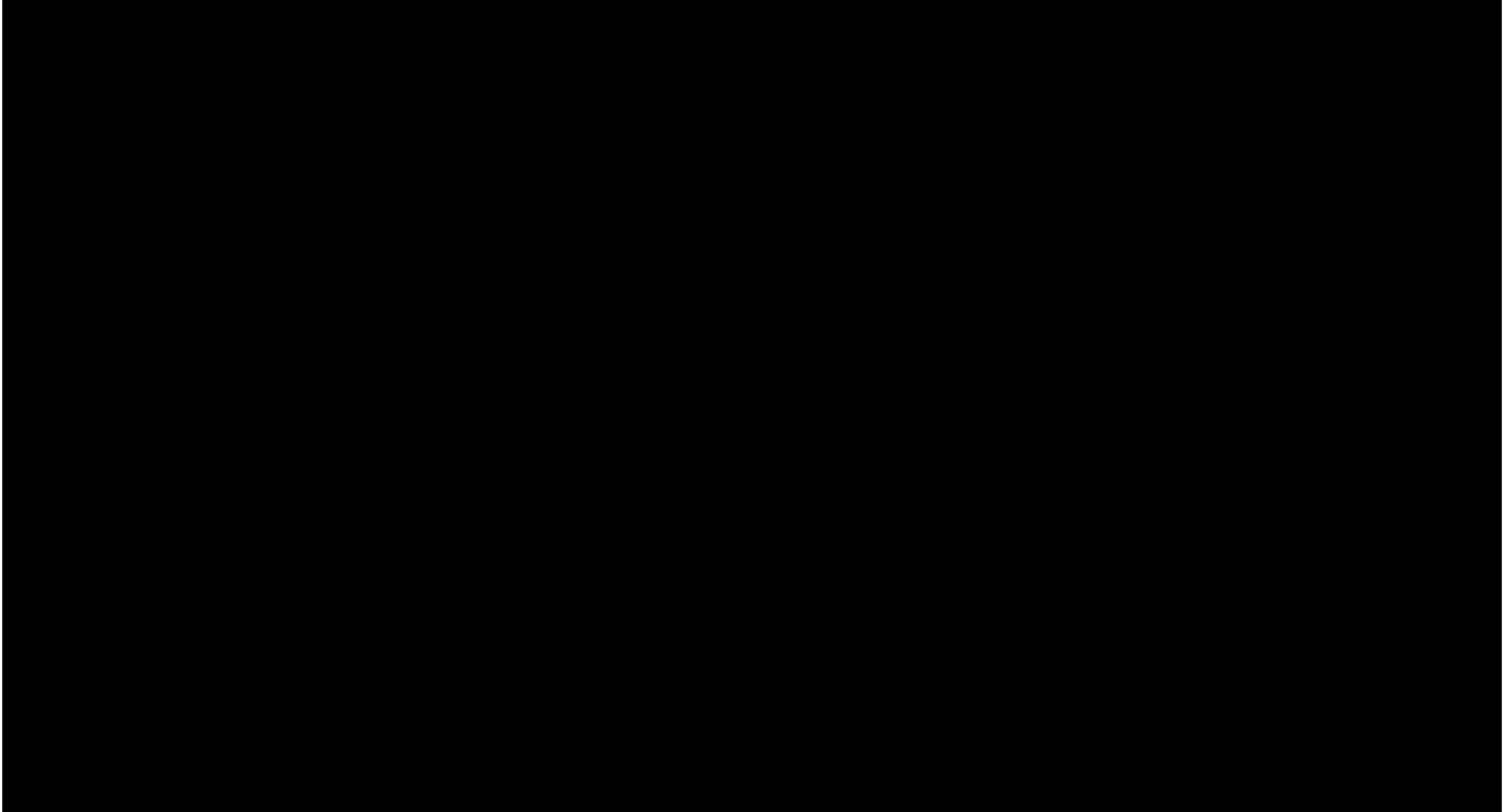


Executive summary

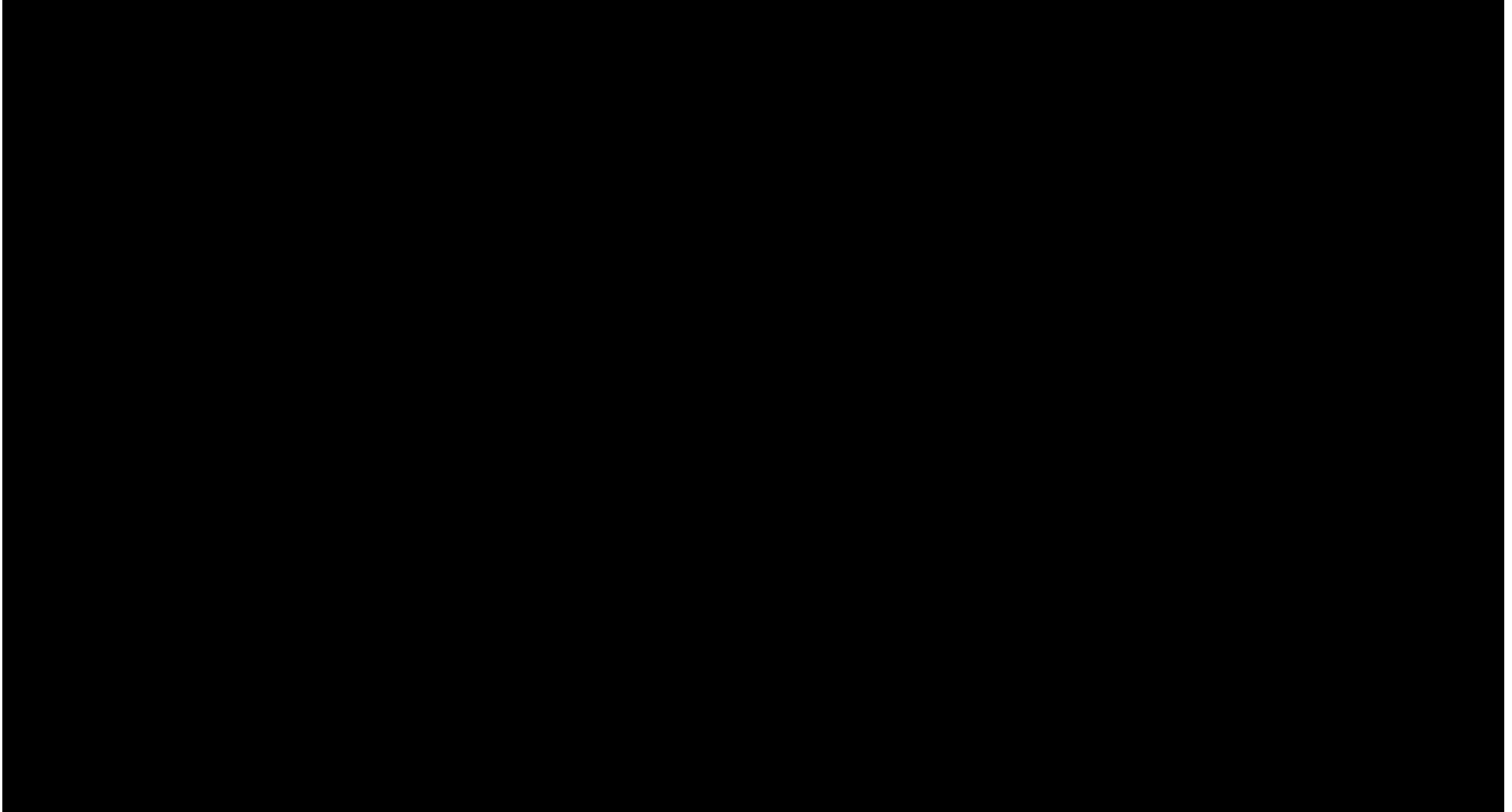
2016 Utilities IT Benchmarking



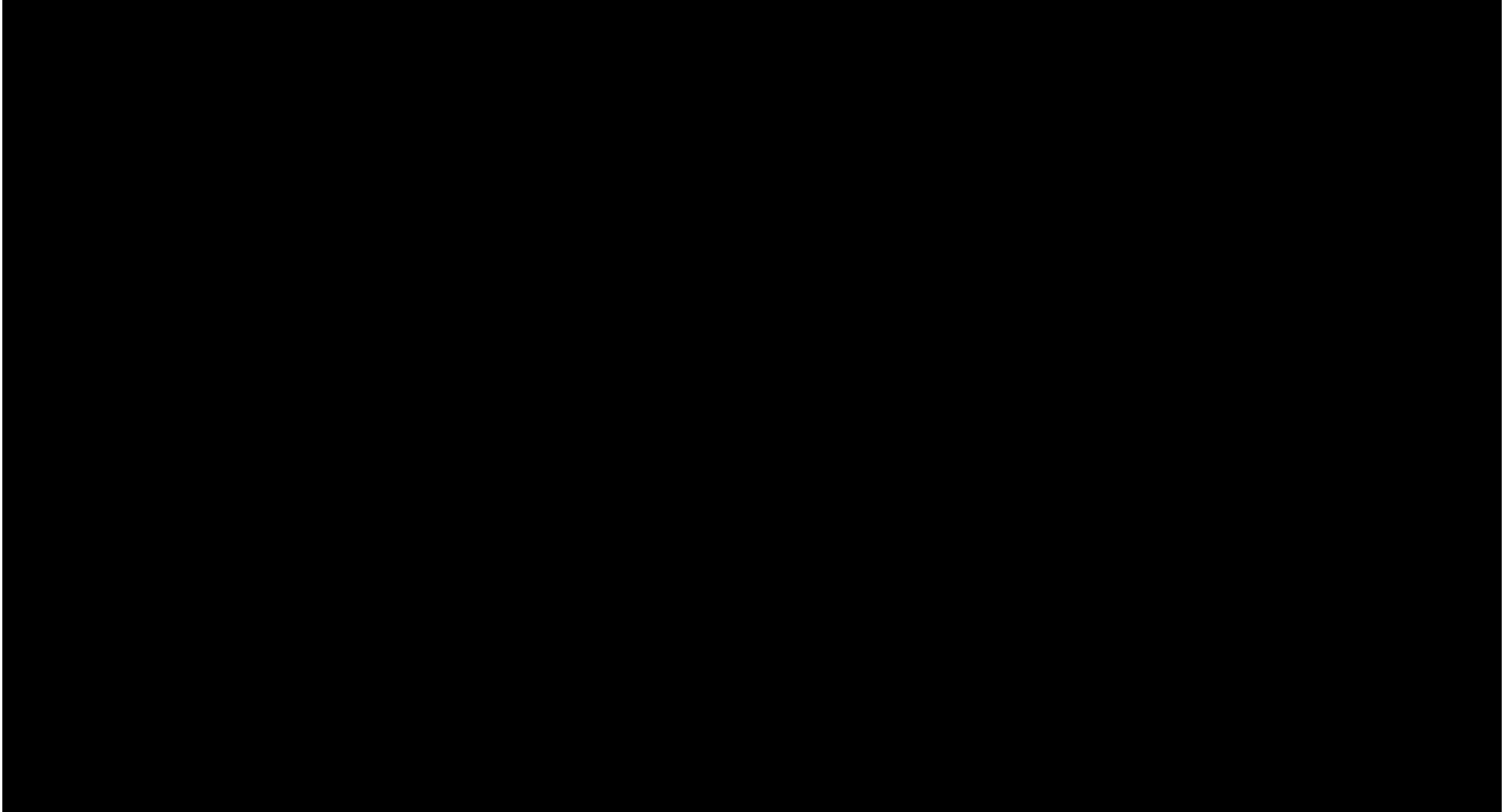
Executive Summary - Overview



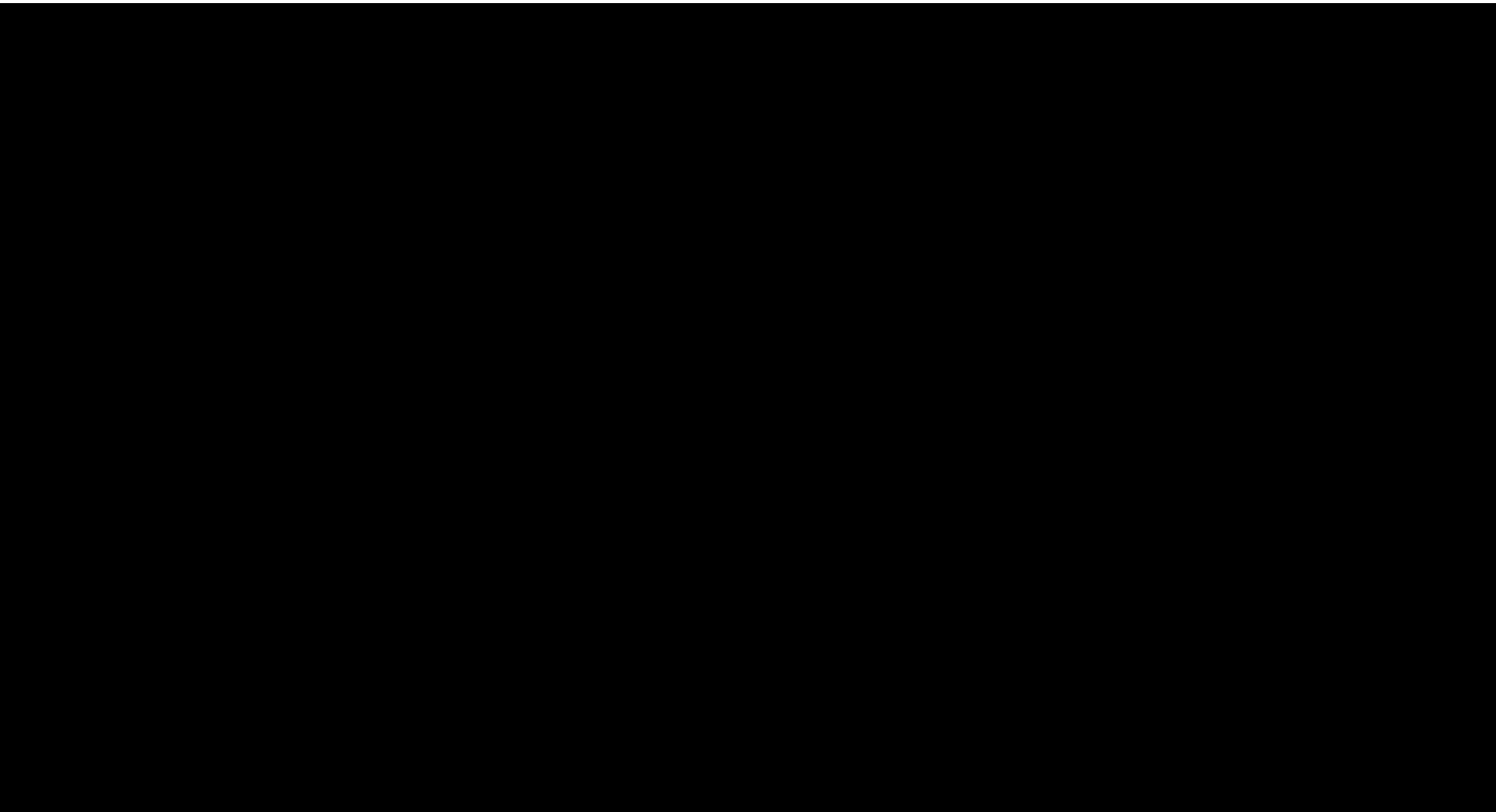
Executive Summary - Benchmark Results



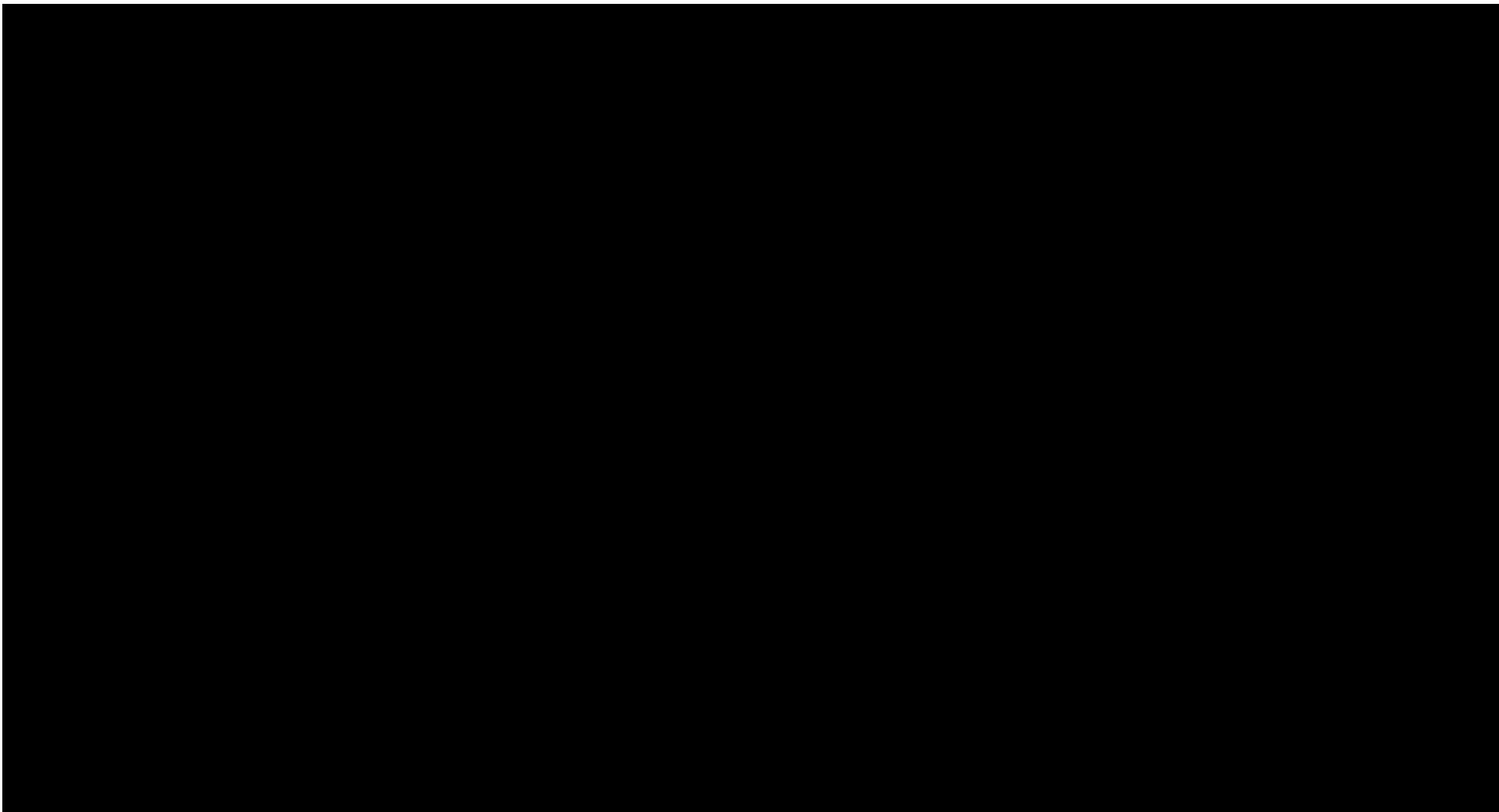
Executive Summary - Benchmark Results



Executive Summary - Benchmark Results



Executive Summary – A final word

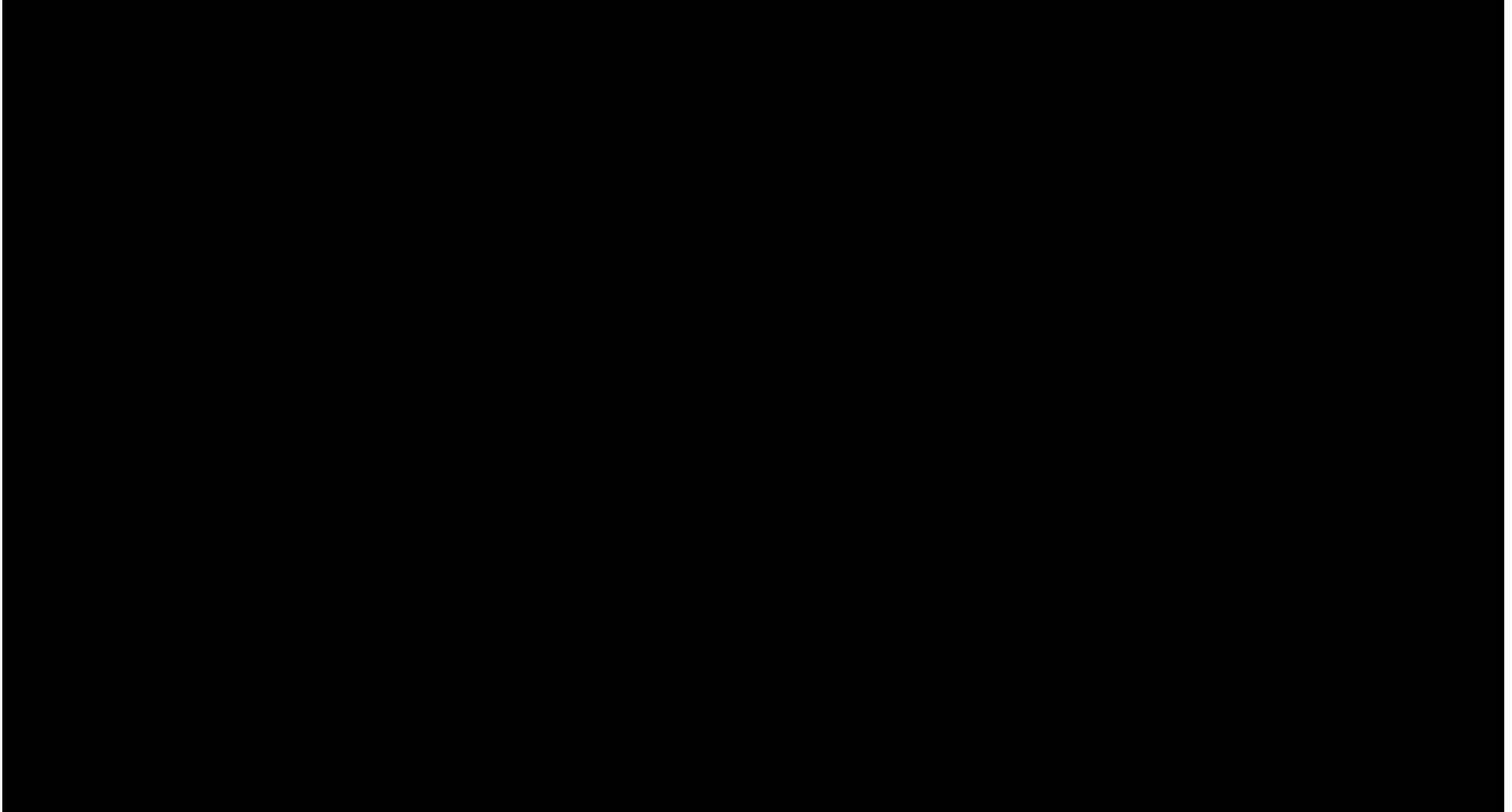




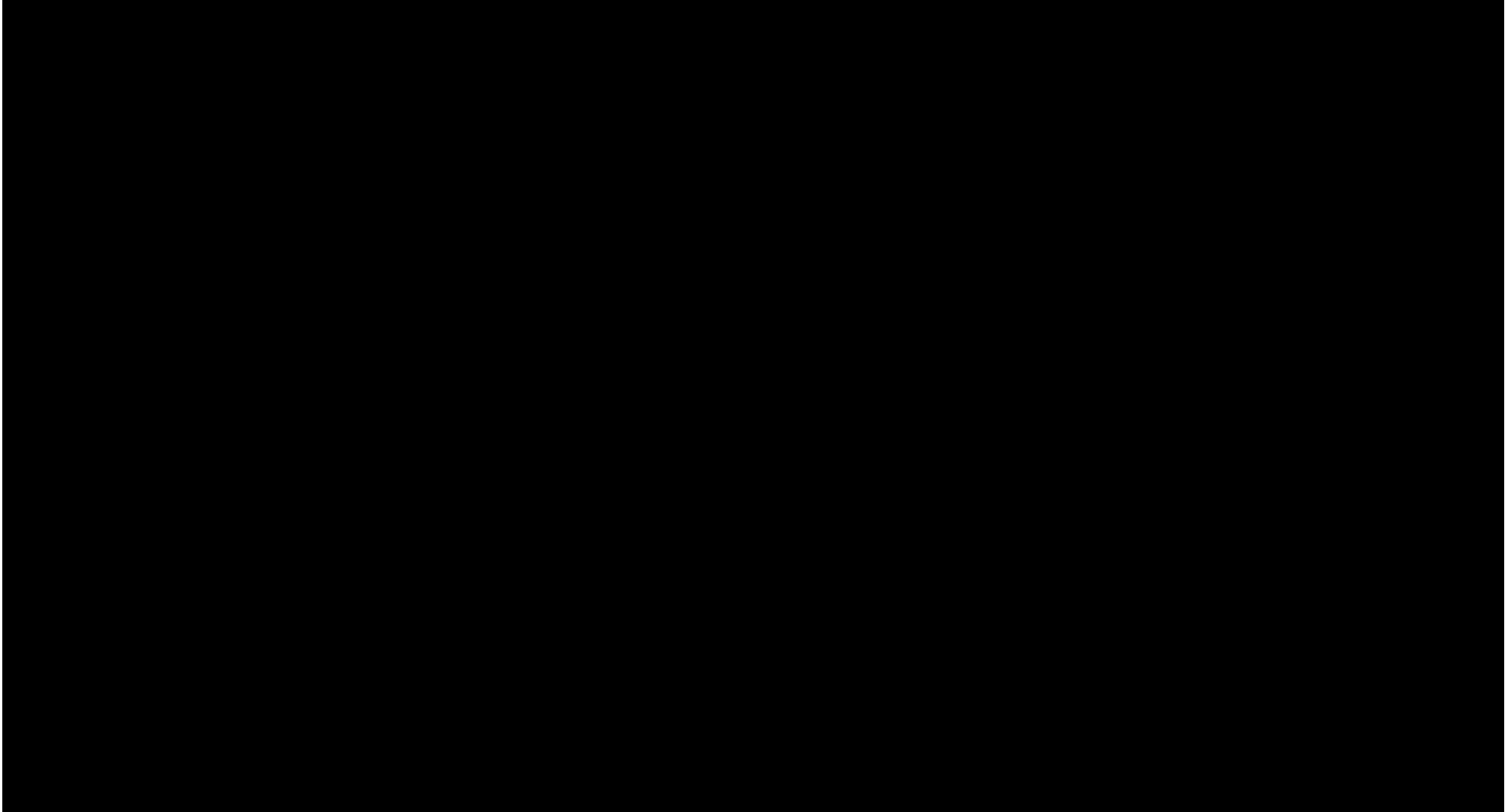
Scope, approach and participants

2016 Utilities IT Benchmarking

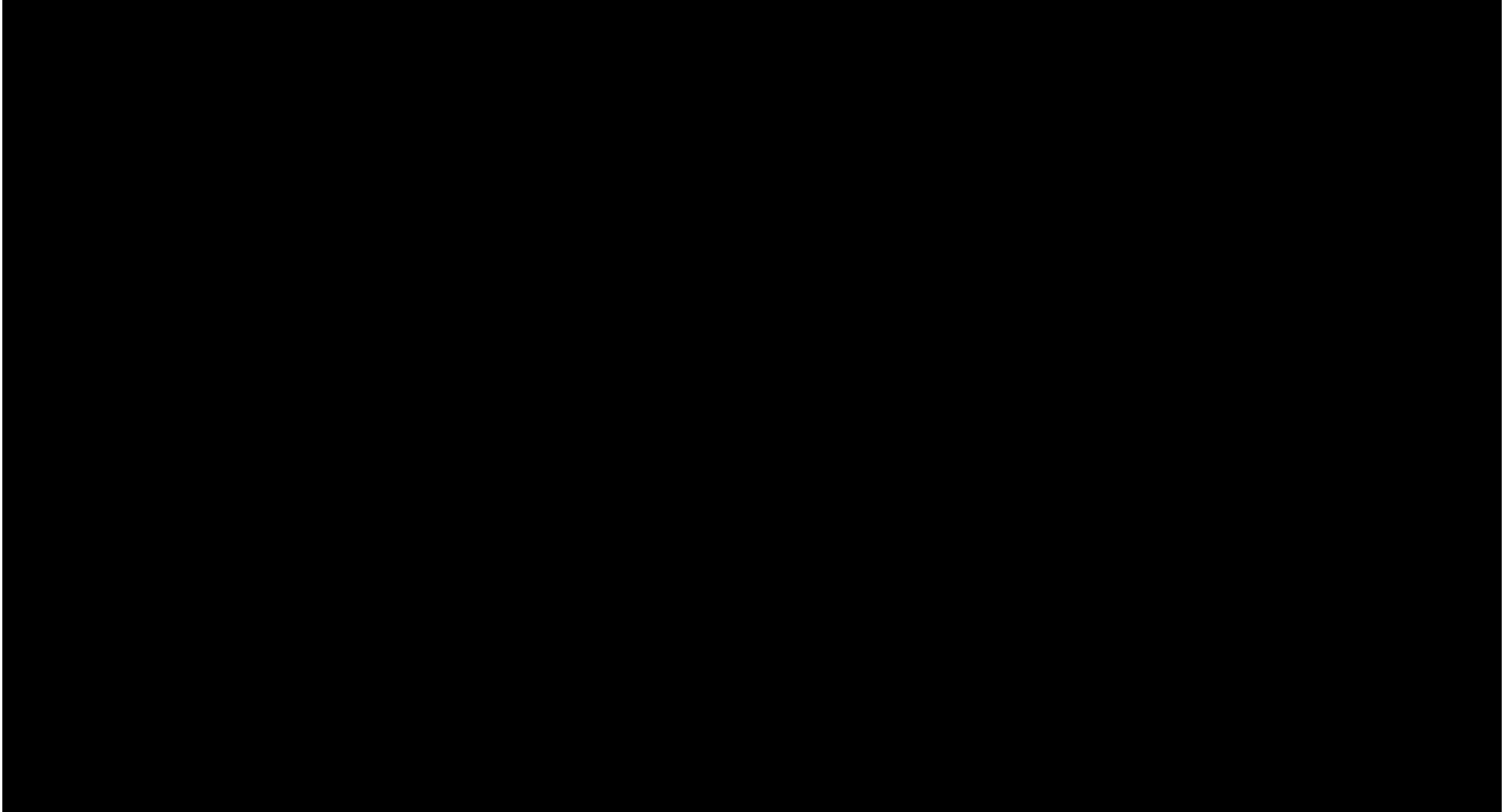
Scope



Approach



Participants

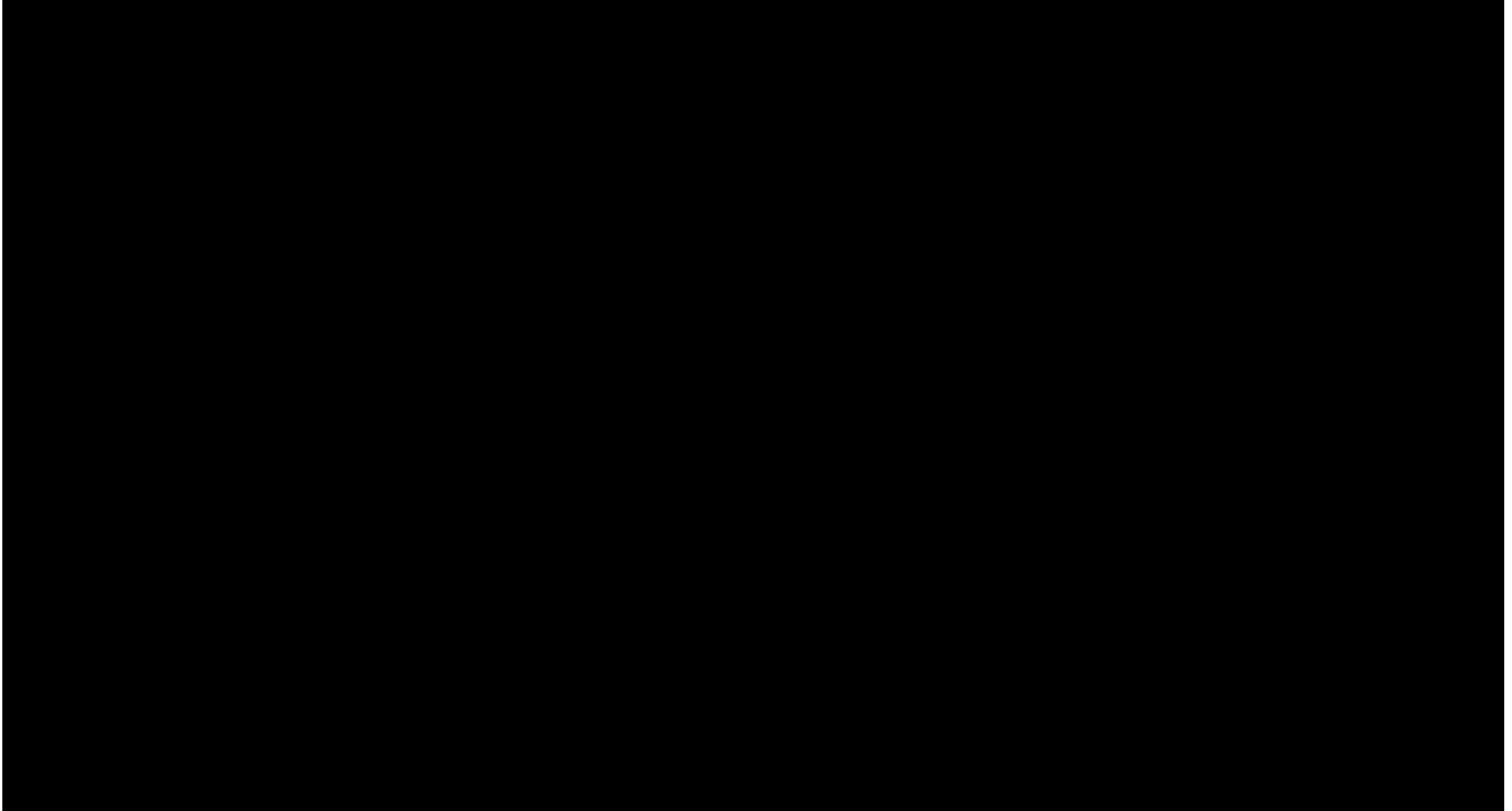




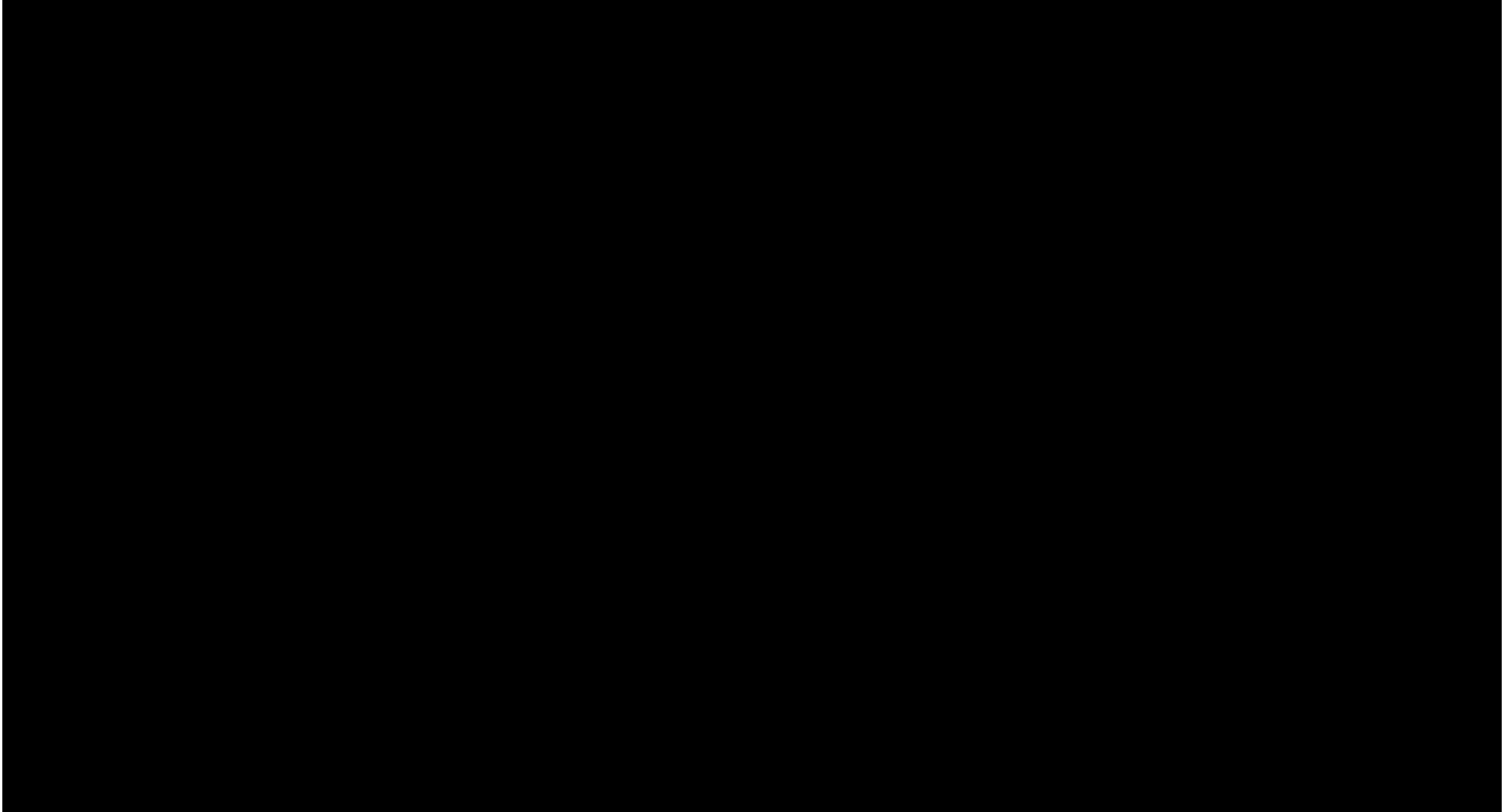
State of the industry

2016 Utilities IT Benchmarking

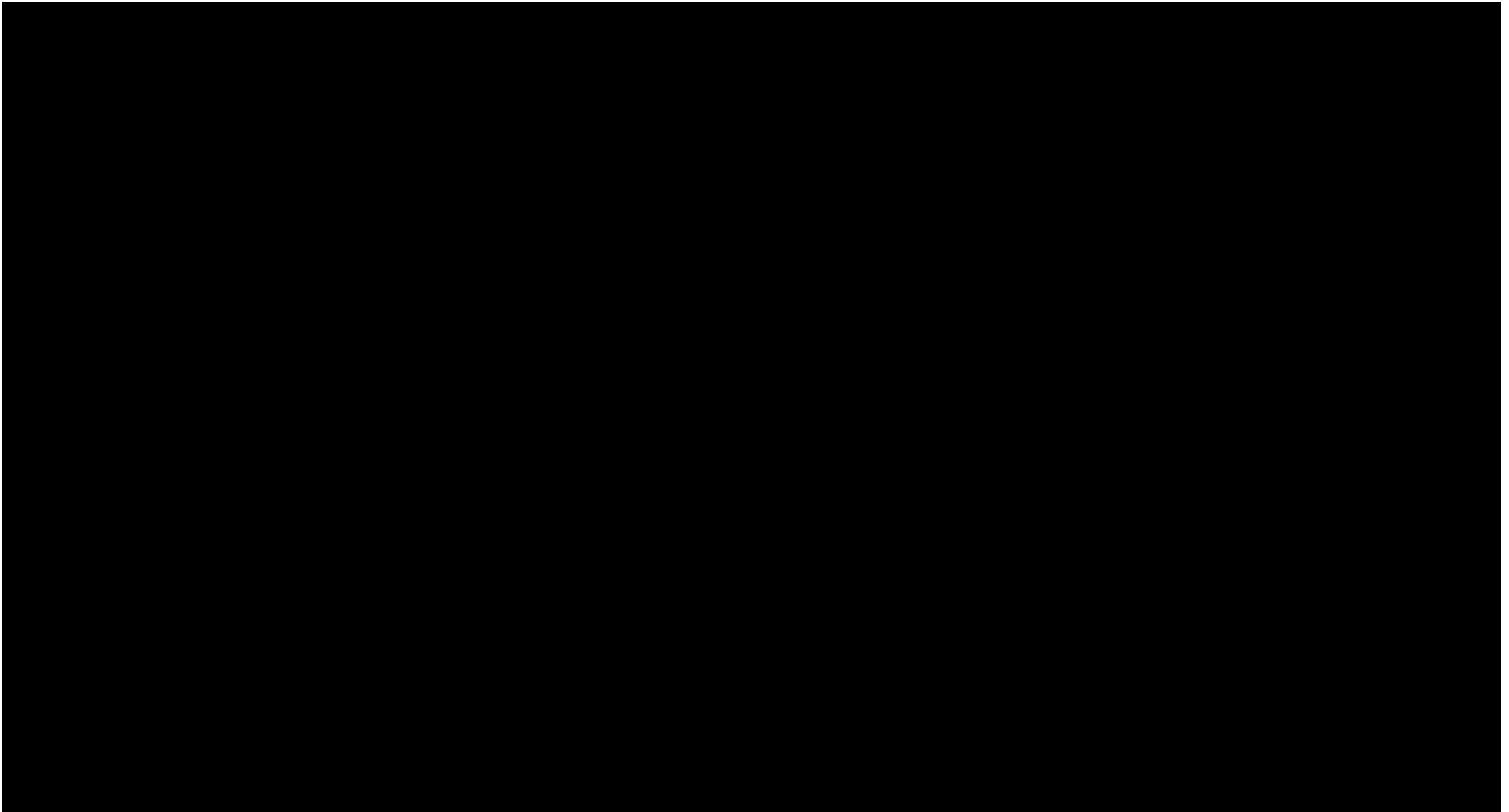
AER benchmarking – key points from the 2016 annual reports



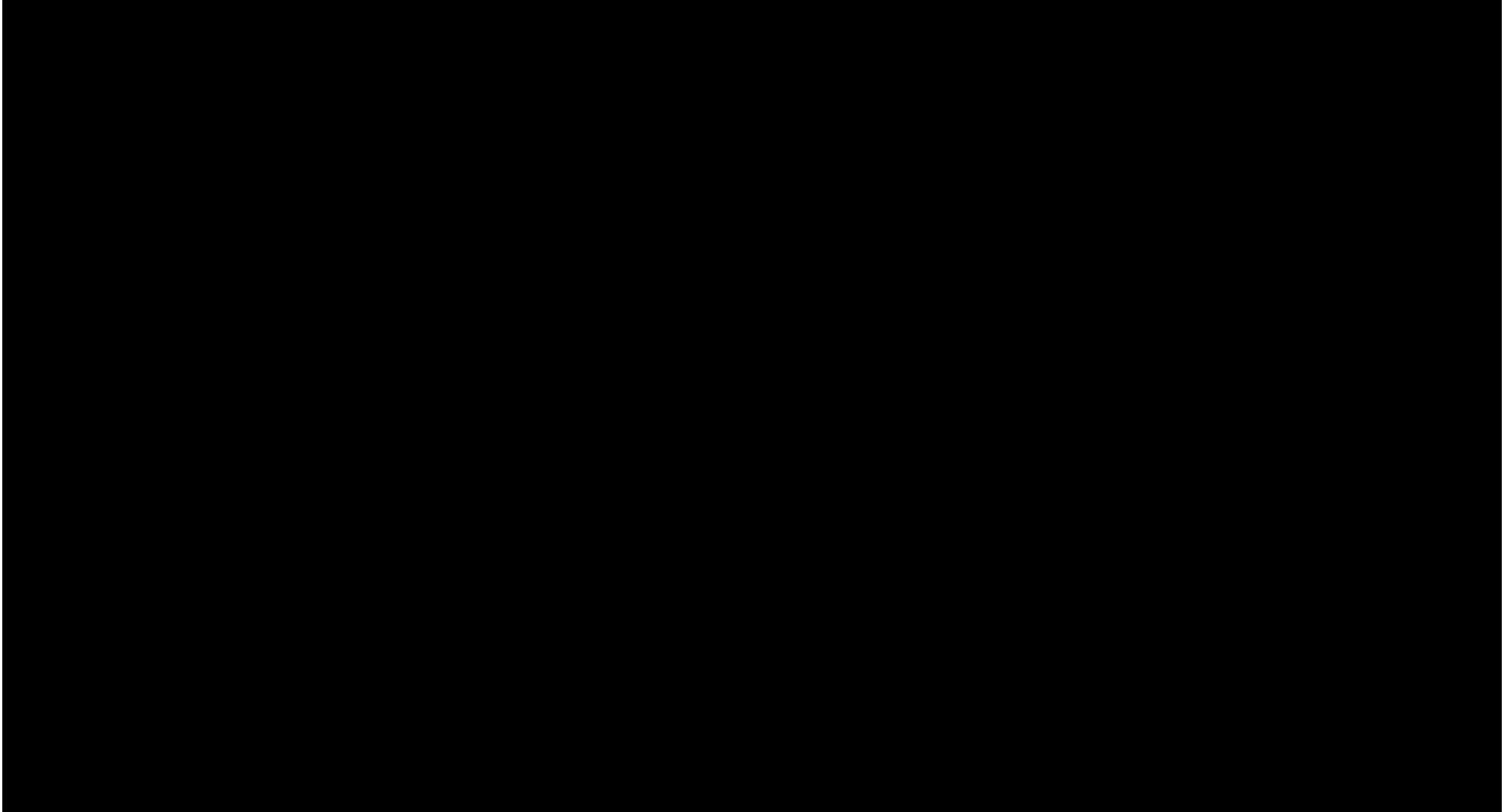
AER benchmarking – key points from the 2016 annual reports



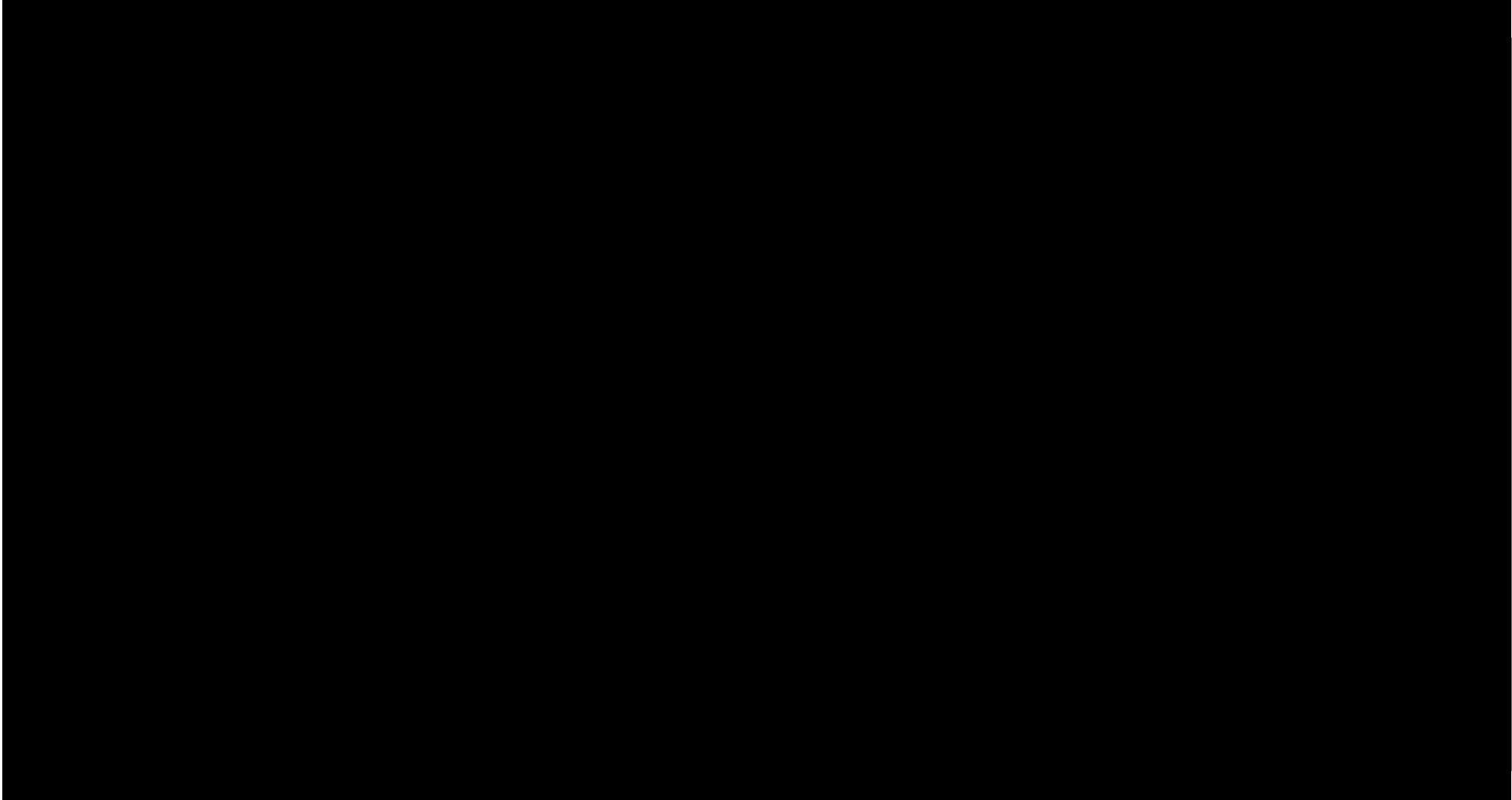
Industry Trends



Industry Trends



WEF - EAPI 2016 - Heat map



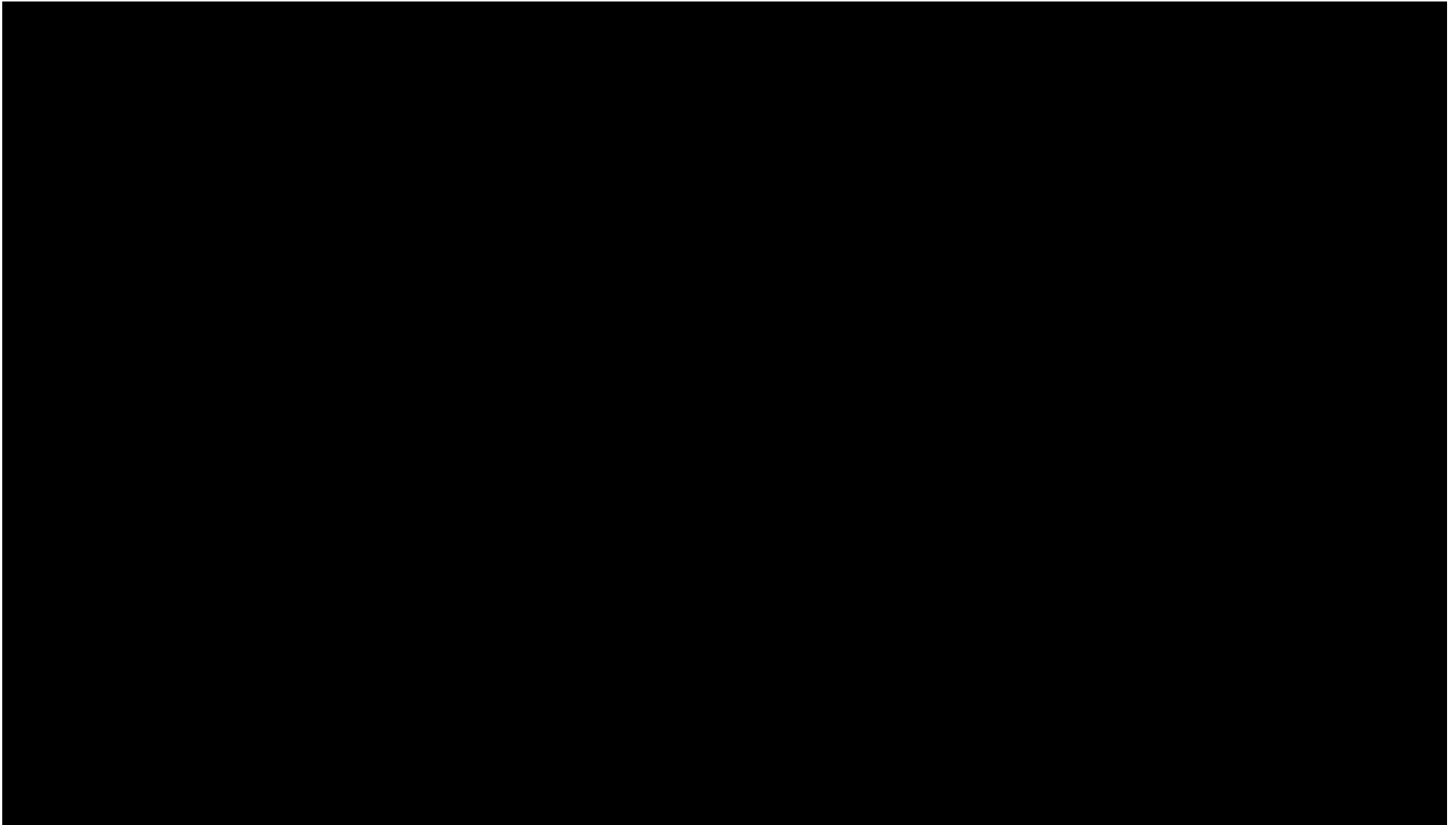


Presentation

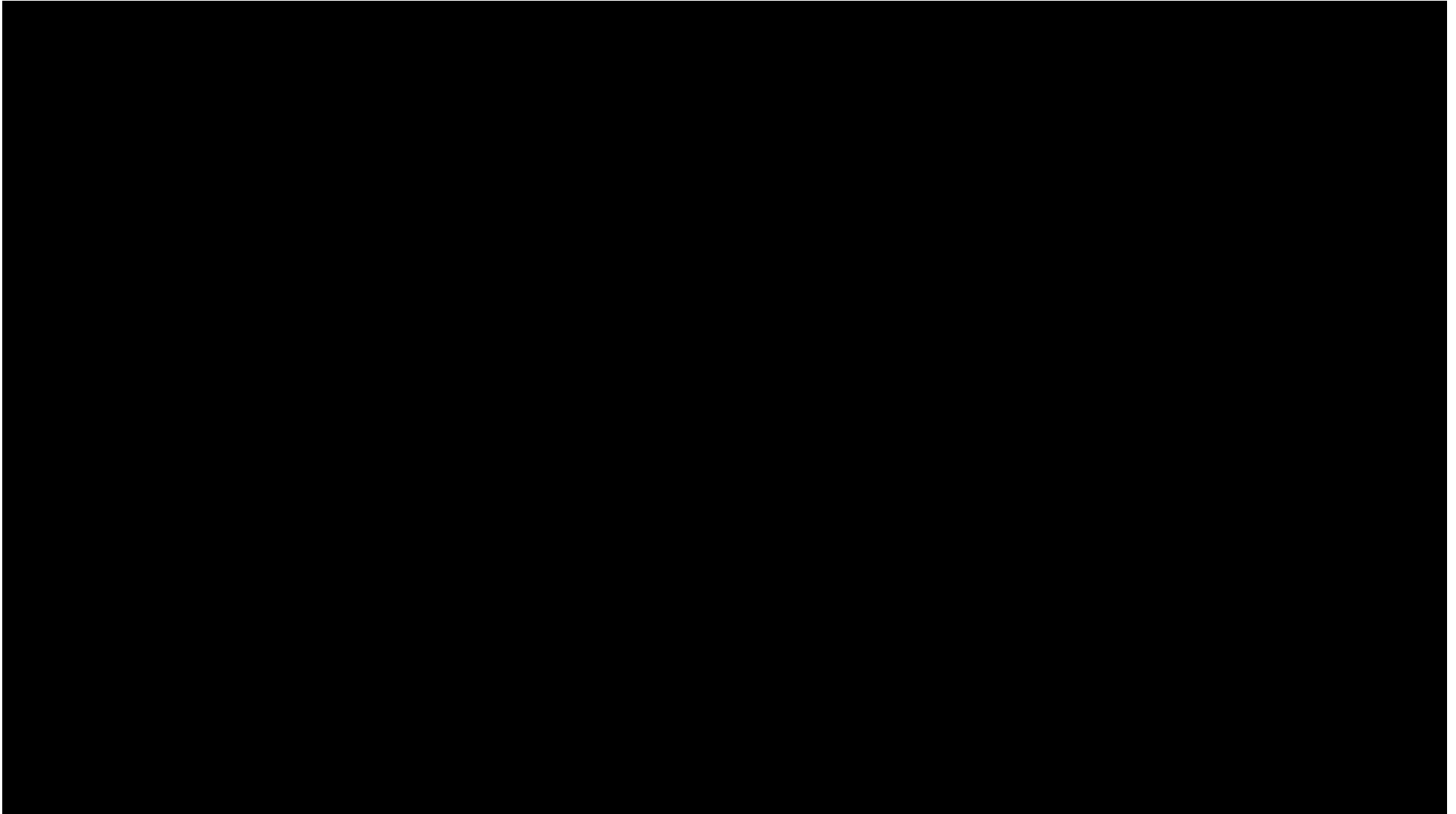
Benchmarking results

2016 Utilities IT Benchmarking

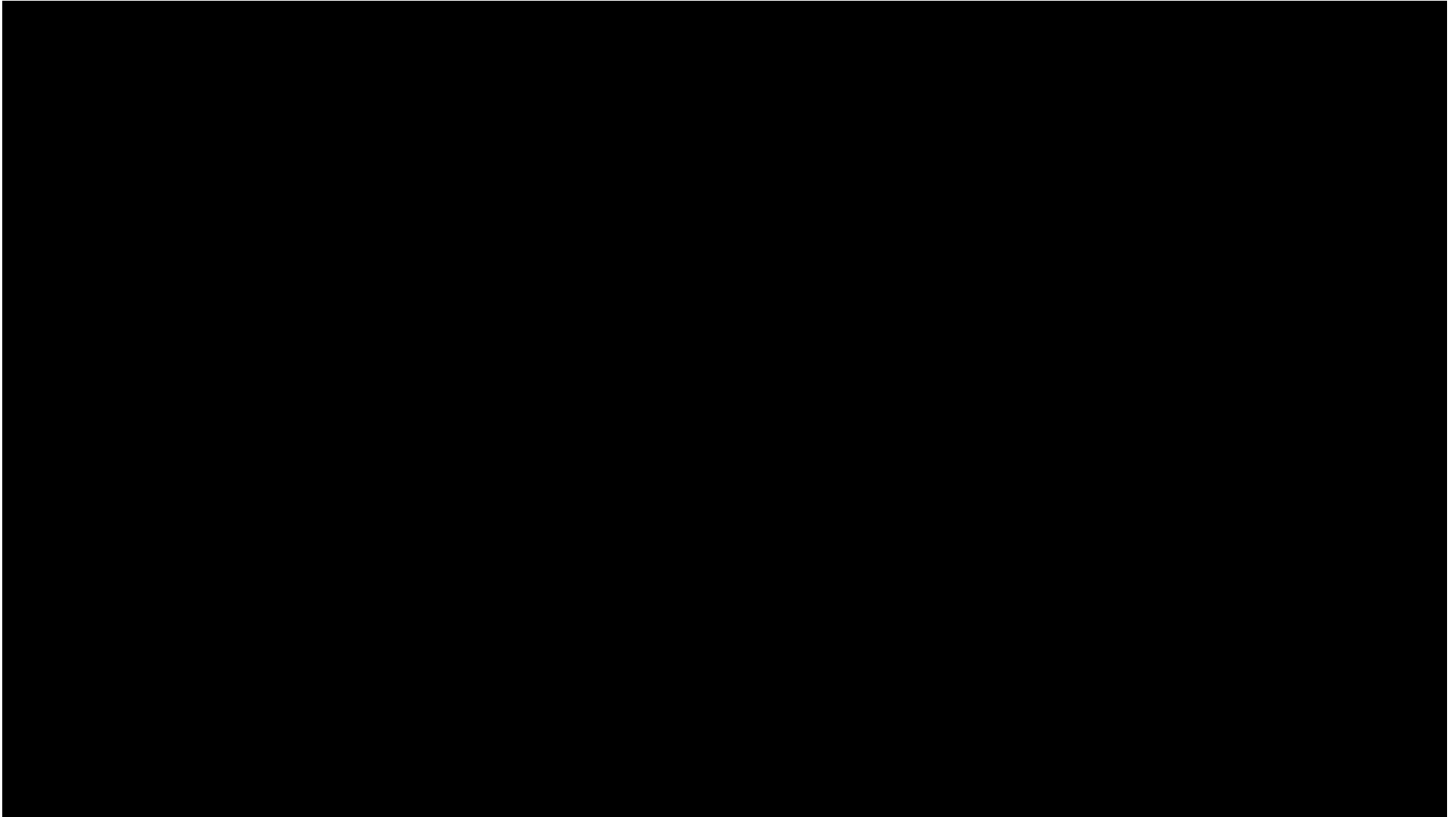
Bar and range charts



Breakdown charts



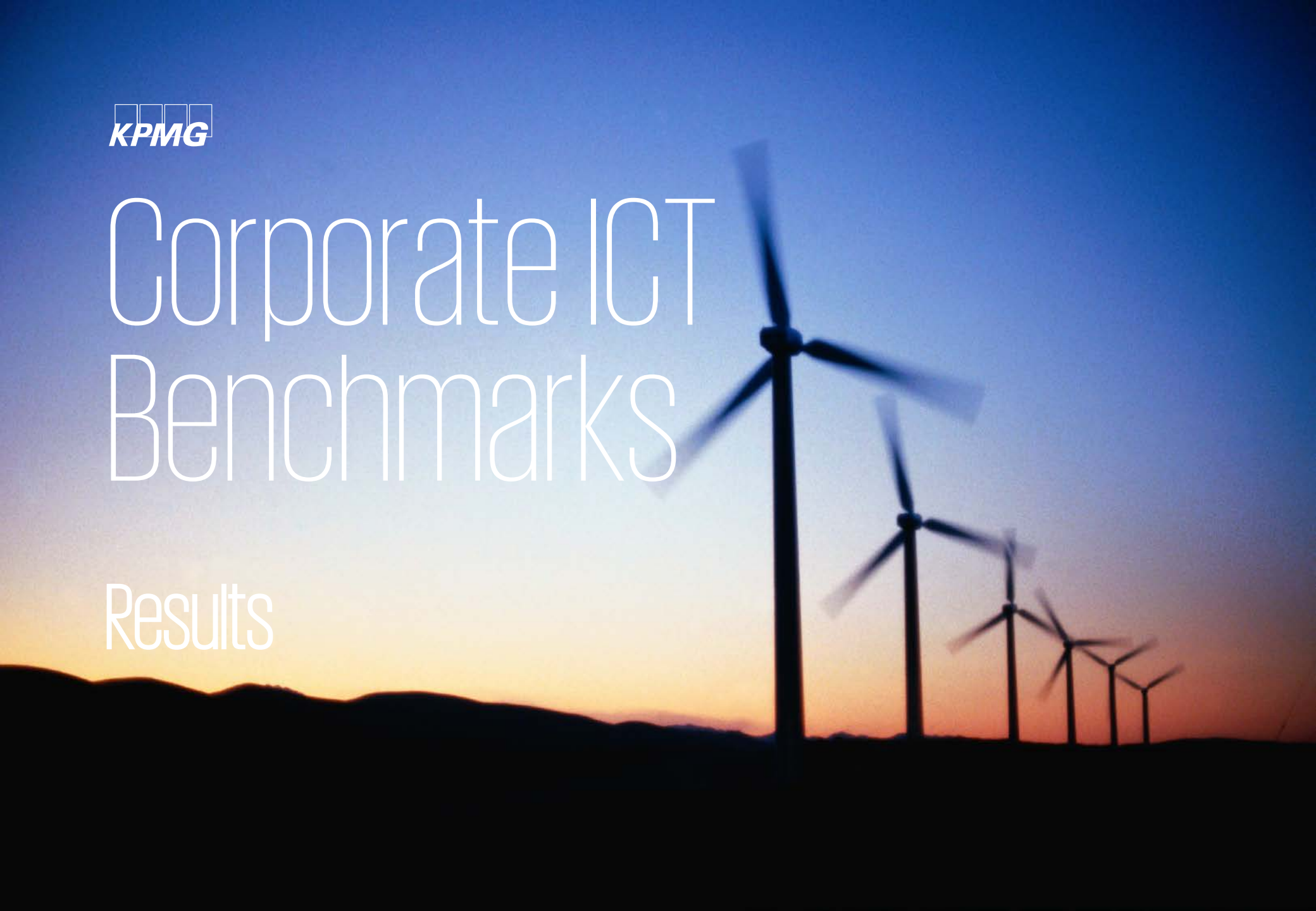
Trend line charts





Corporate ICT Benchmarks

Results



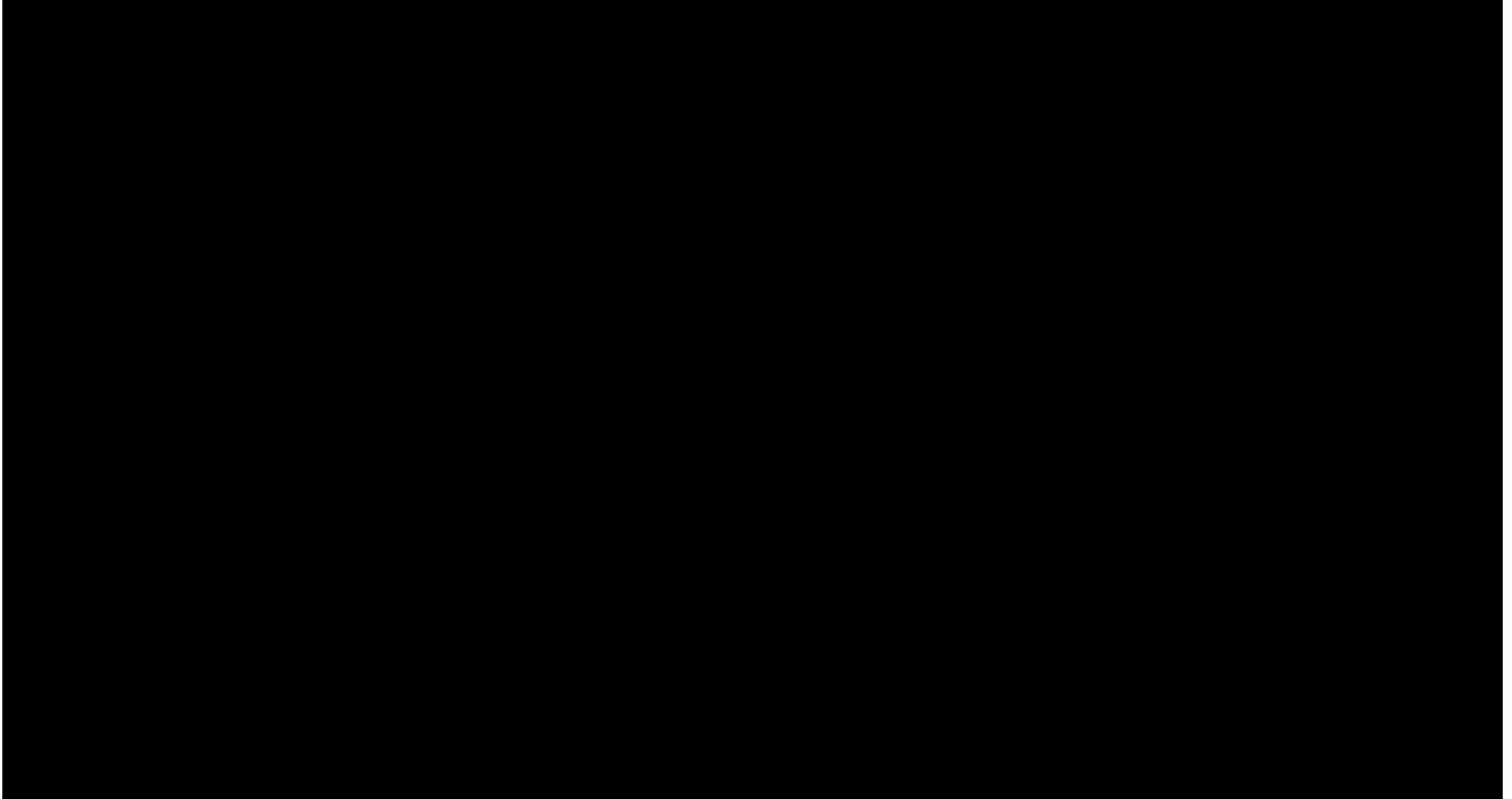


Corporate Information & Communications Technology Benchmarks

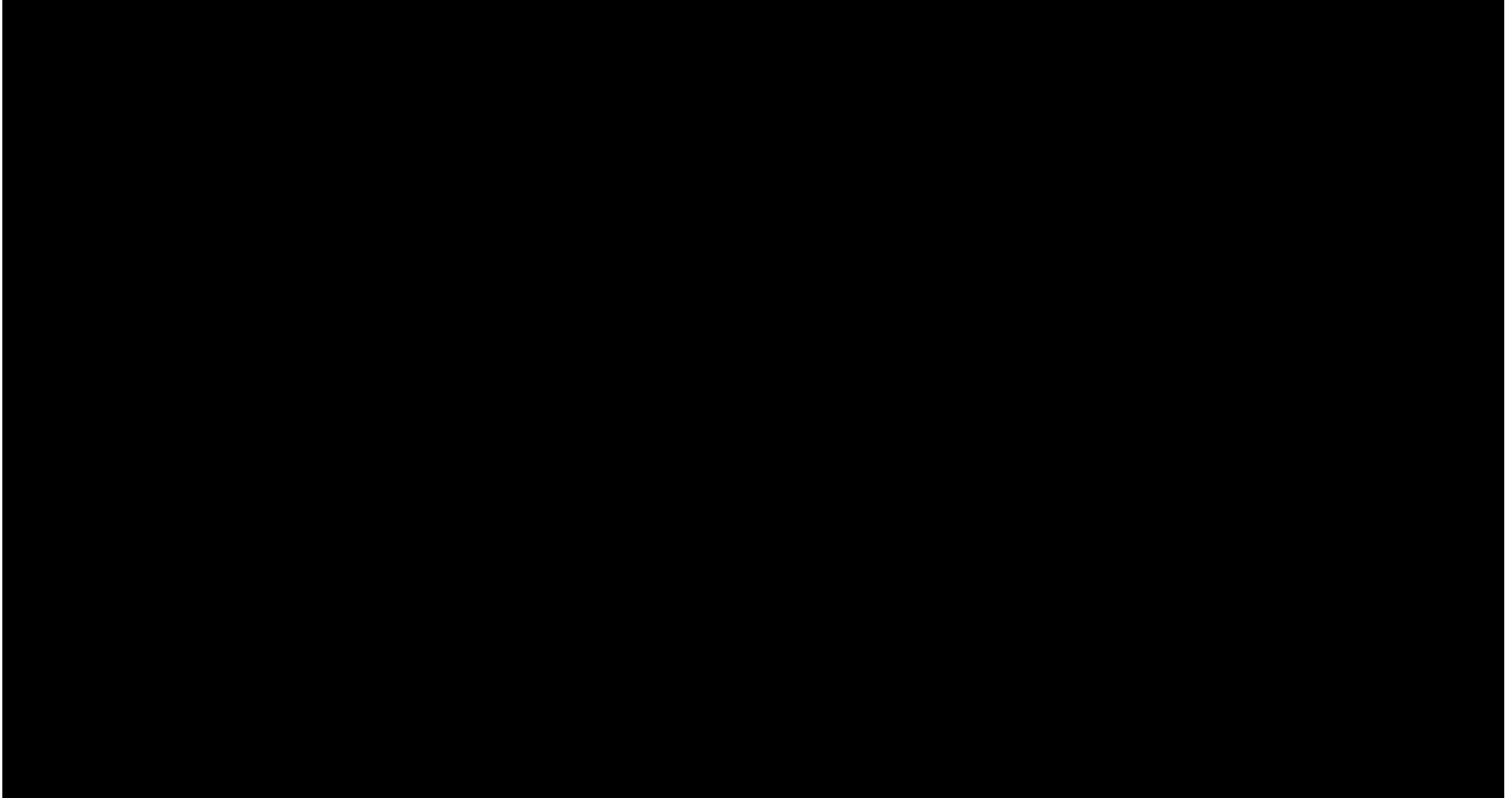
Financial Metrics

- ICT operating expenditure (including & excluding depreciation) as a % of corporate revenue,
- ICT operating expenditure (including & excluding depreciation) as a % of corporate operating expenditure,
- ICT operating expenditure (excluding depreciation) per user, client device and ICT staff member,
- Category breakdown of ICT operating expenditure (excluding depreciation),
- ICT capital expenditure as a % of corporate capital expenditure,
- ICT asset value as a % of total corporate asset value,
- OT expenditure (excluding depreciation) as a % of corporate expenditure (operating & capital),
- Metering Technology expenditure (excluding depreciation) as a % of corporate expenditure (operating & capital),
- ICT depreciation as a % of ICT asset value,
- Digital security expenditure as a % of corporate expenditure (operating & capital),
- Innovation expenditure as a % of corporate expenditure (operating & capital),
- Corporate totex per corporate customer, organisation personnel,
- ICT totex as a % of corporate totex,
- ICT totex per corporate customer, organisation personnel, ICT personnel, and
- Technology domain breakdown of total ICT opex and capex.

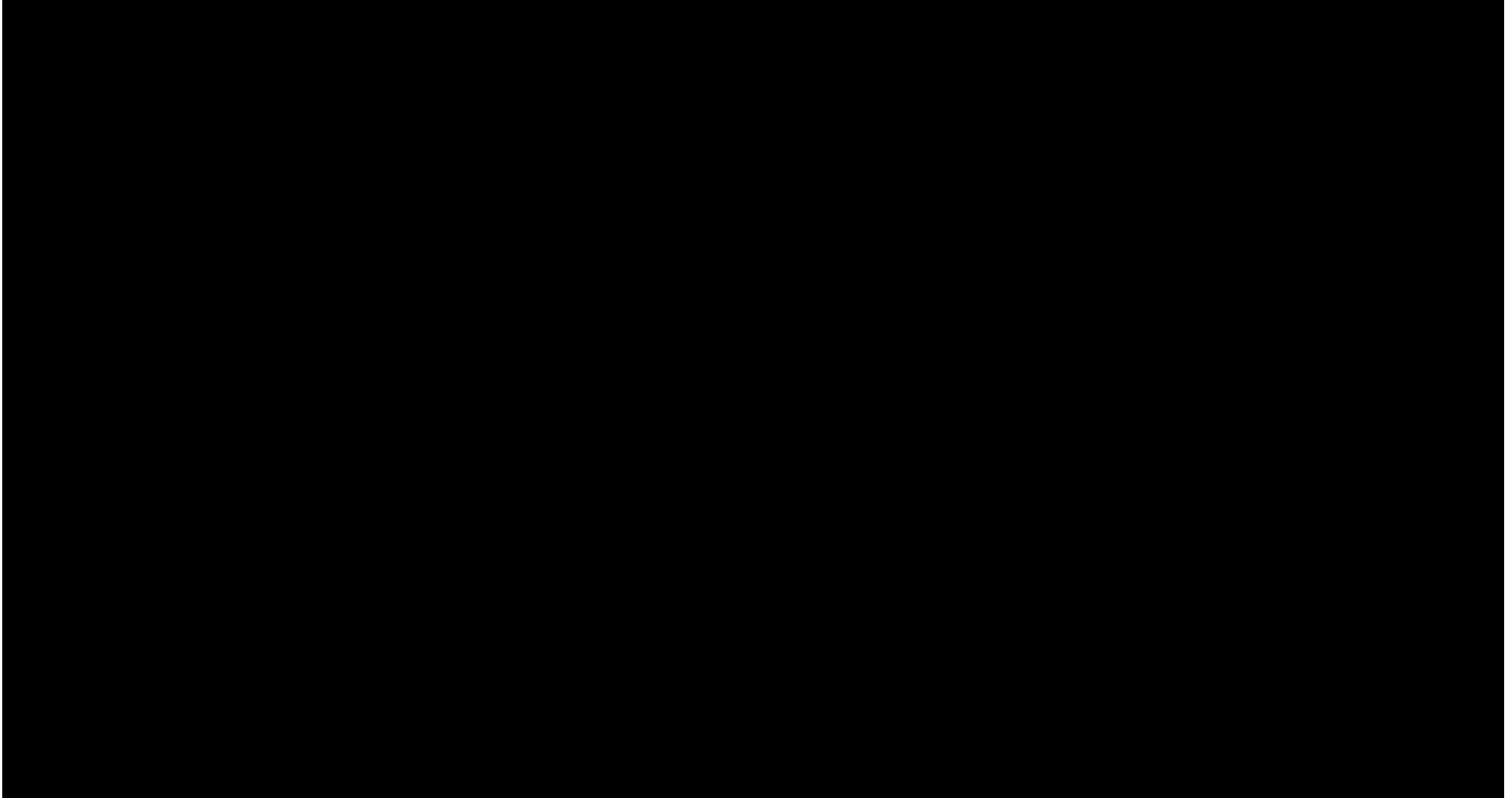
ICT operating expenditure (include depreciation) as a % of corporate revenue



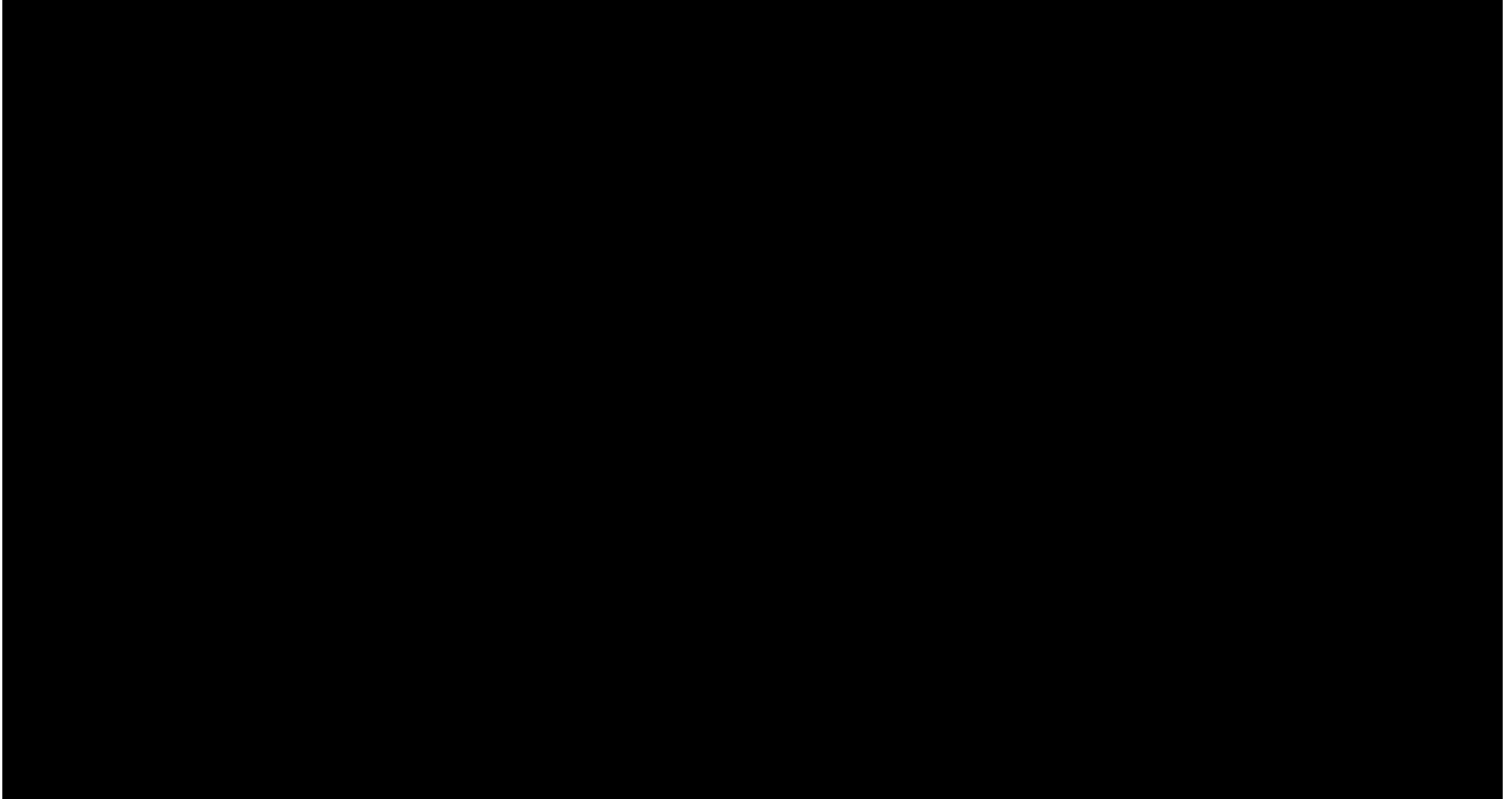
ICT operating expenditure (excluding depreciation) as a % of corporate revenue



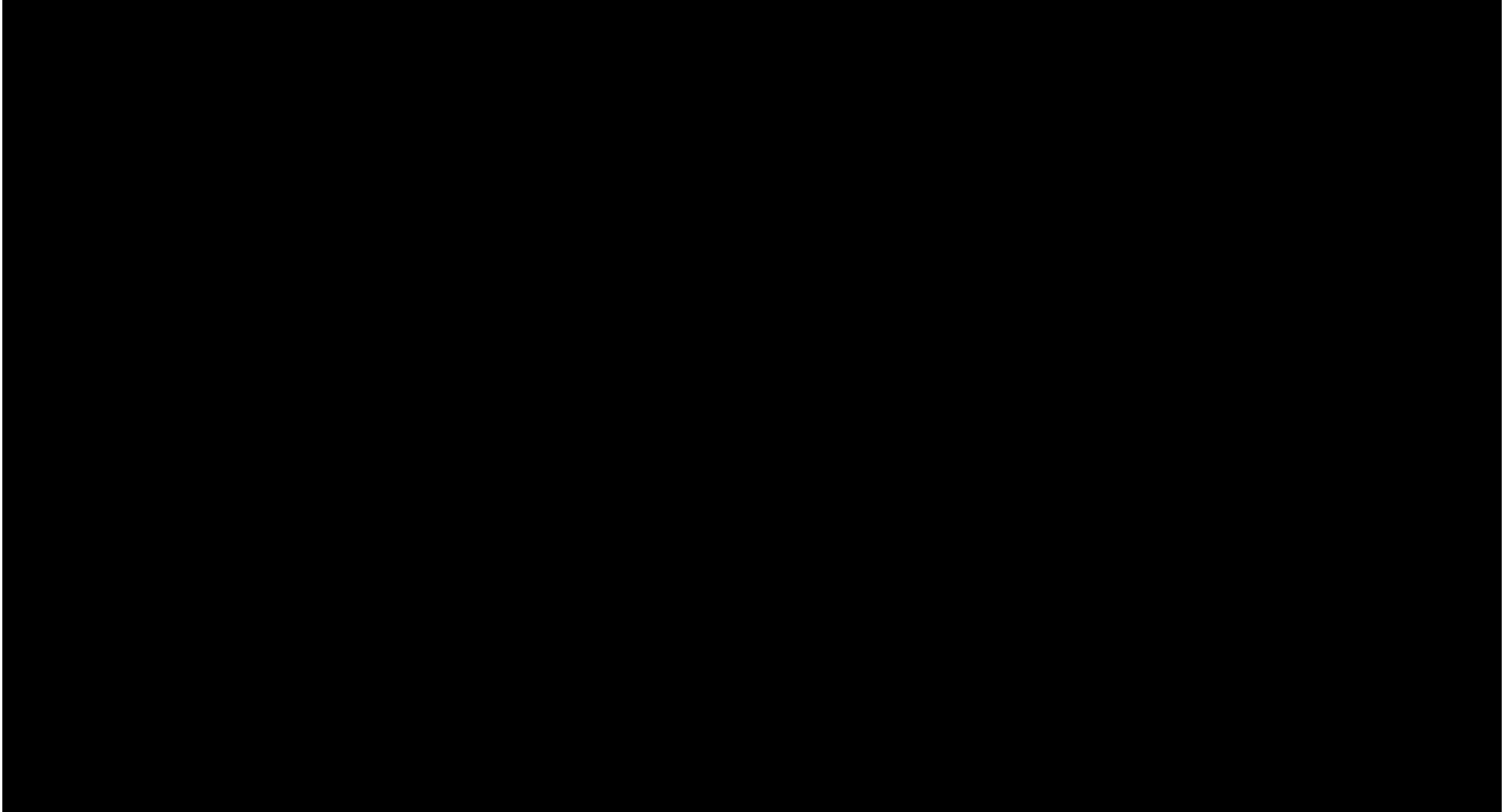
ICT operating expenditure (including depreciation) as a % of corporate operating expenditure



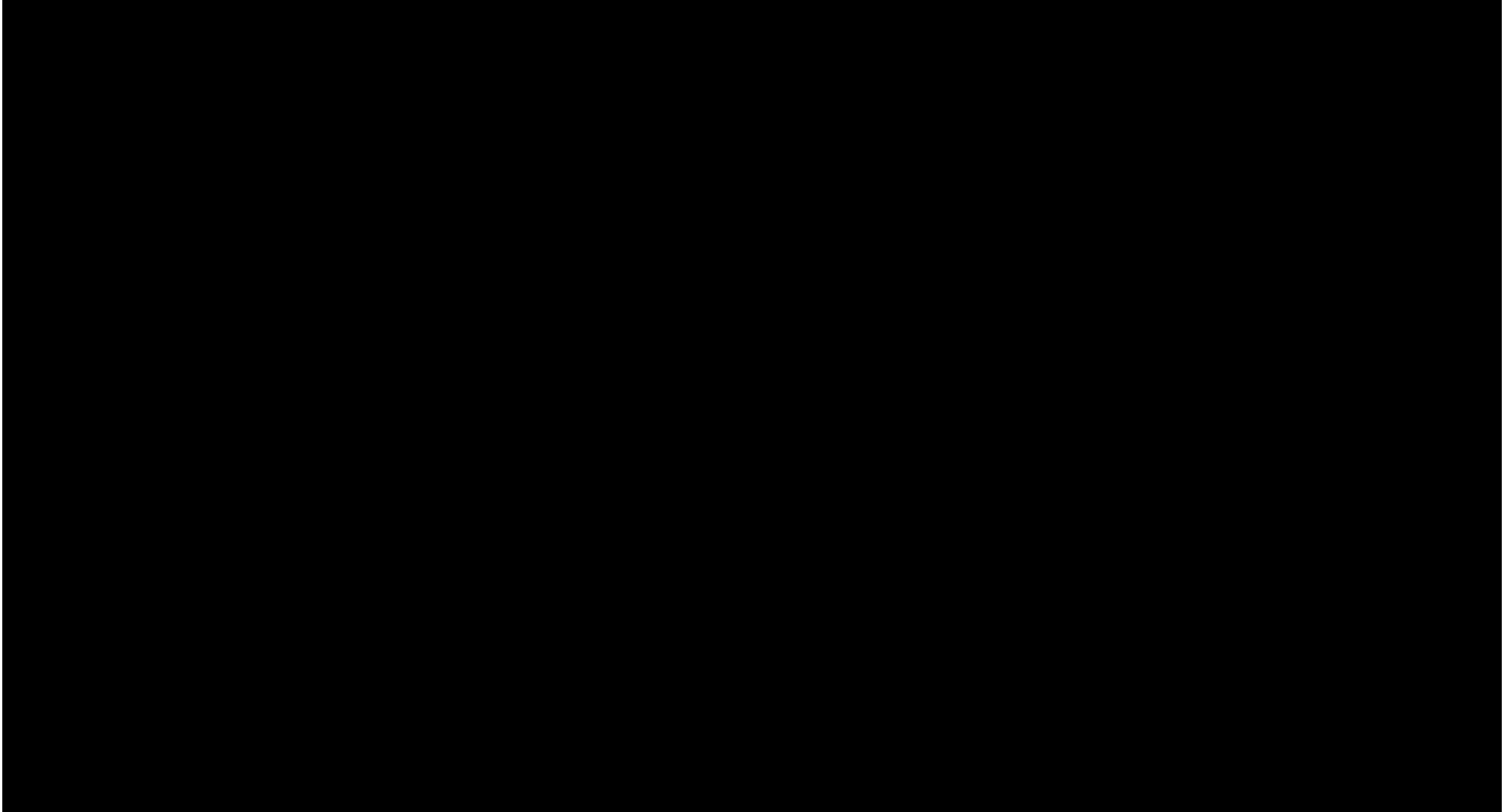
ICT operating expenditure (excluding depreciation as a % of corporate operating expenditure



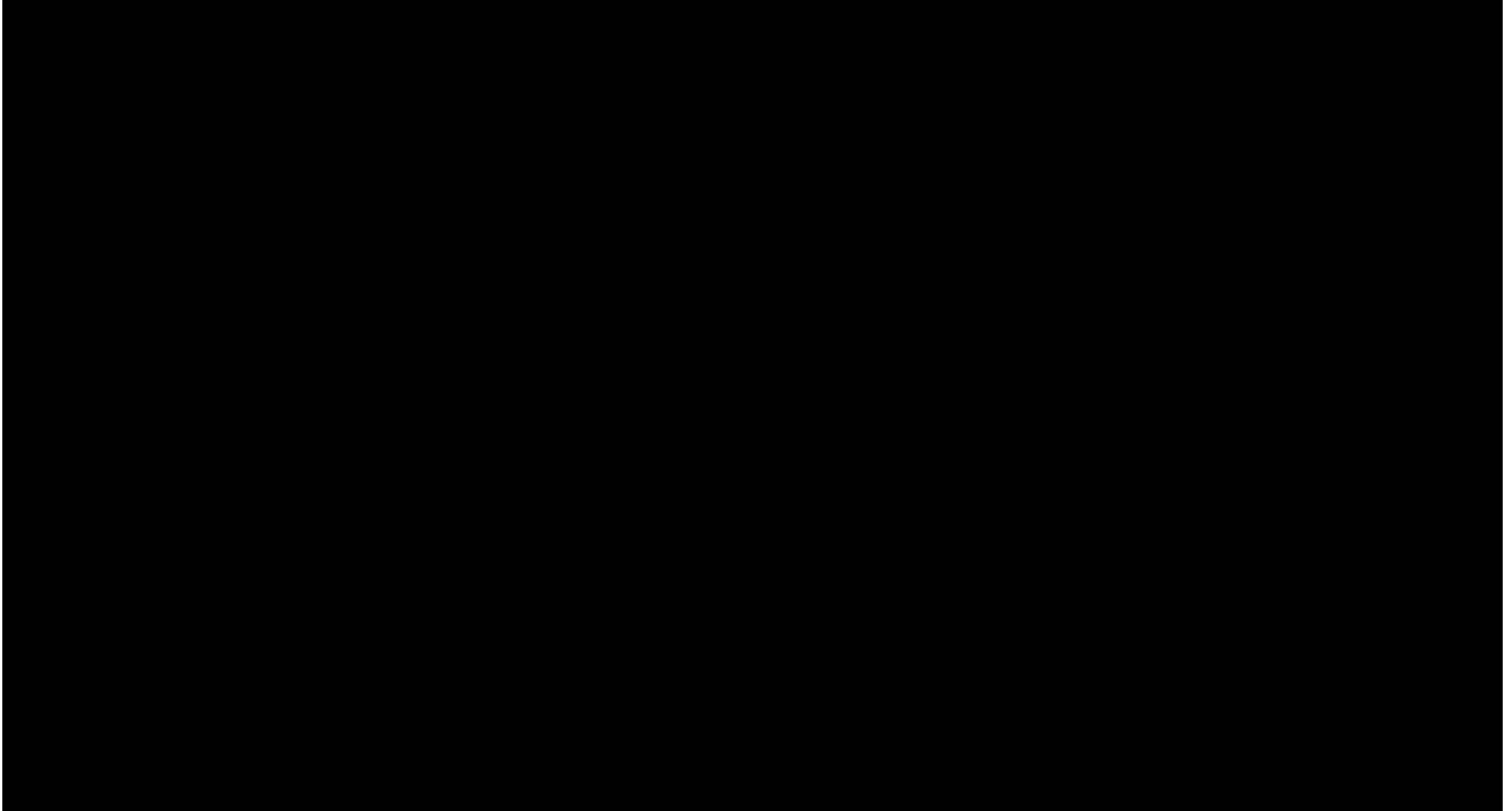
ICT operating expenditure (excluding depreciation) per user



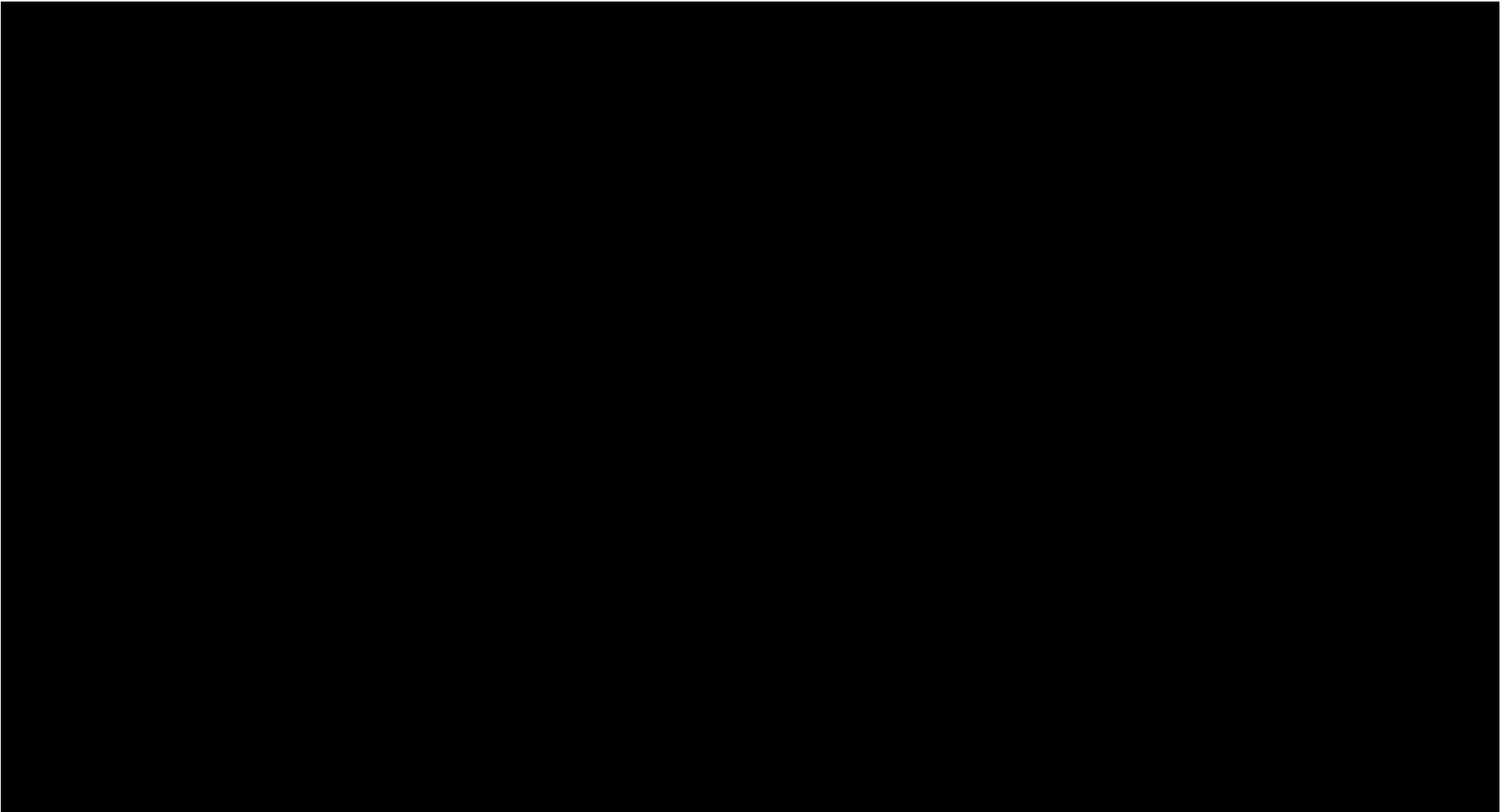
ICT operating expenditure (excluding depreciation) per client device



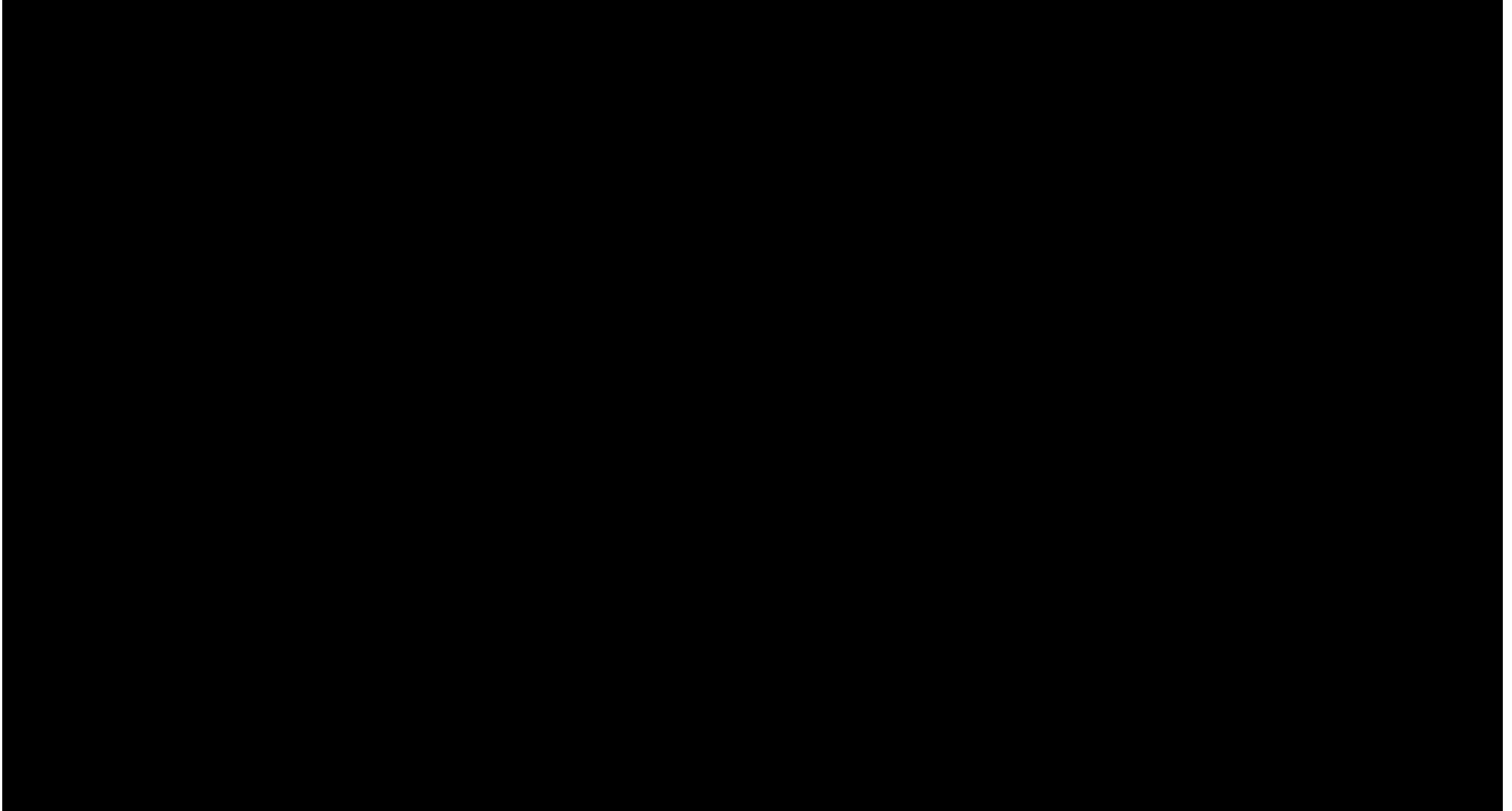
ICT operating expenditure (excluding depreciation) per ICT staff member



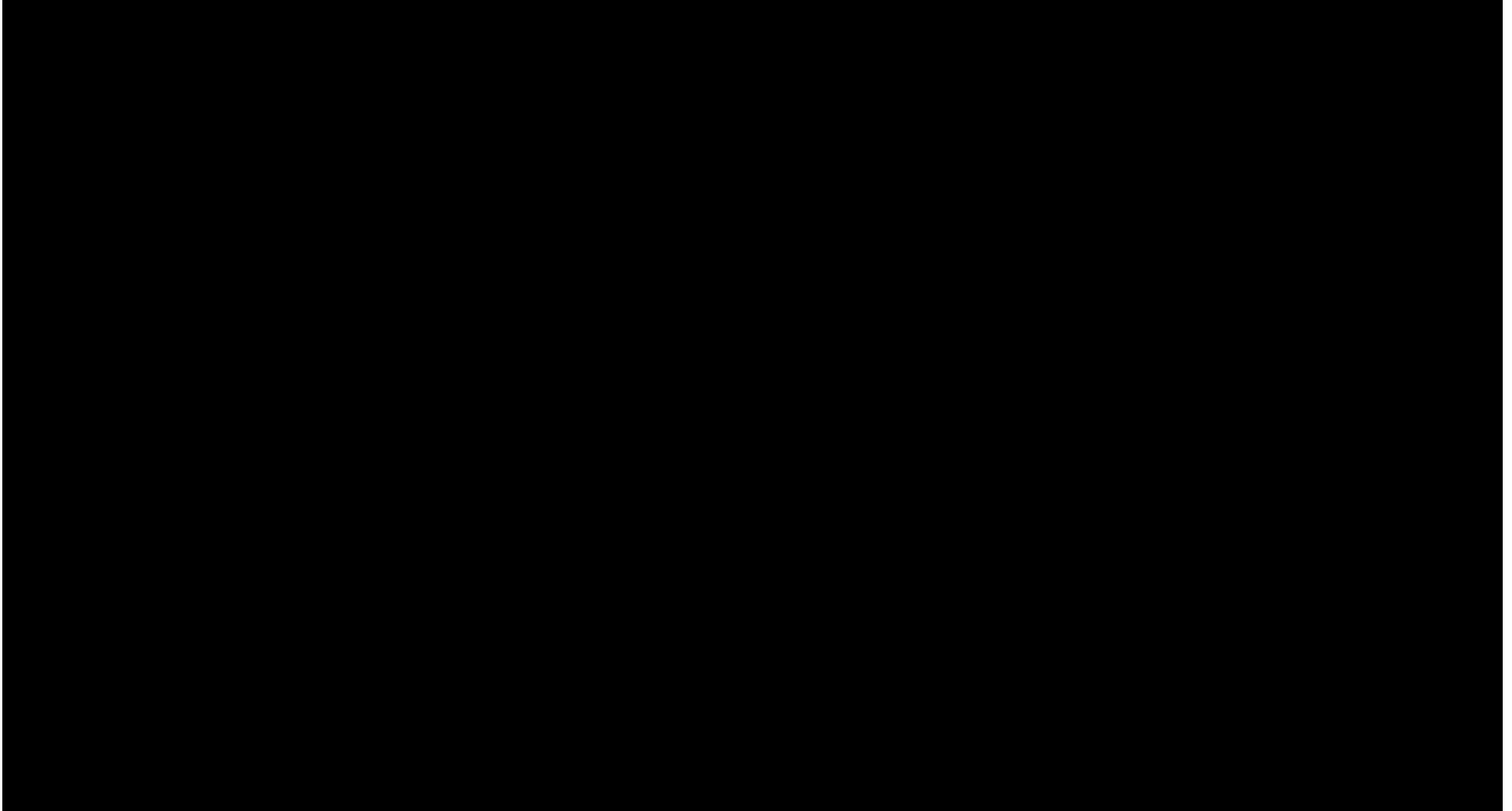
Category breakdown of ICT operating expenditure (excluding depreciation)



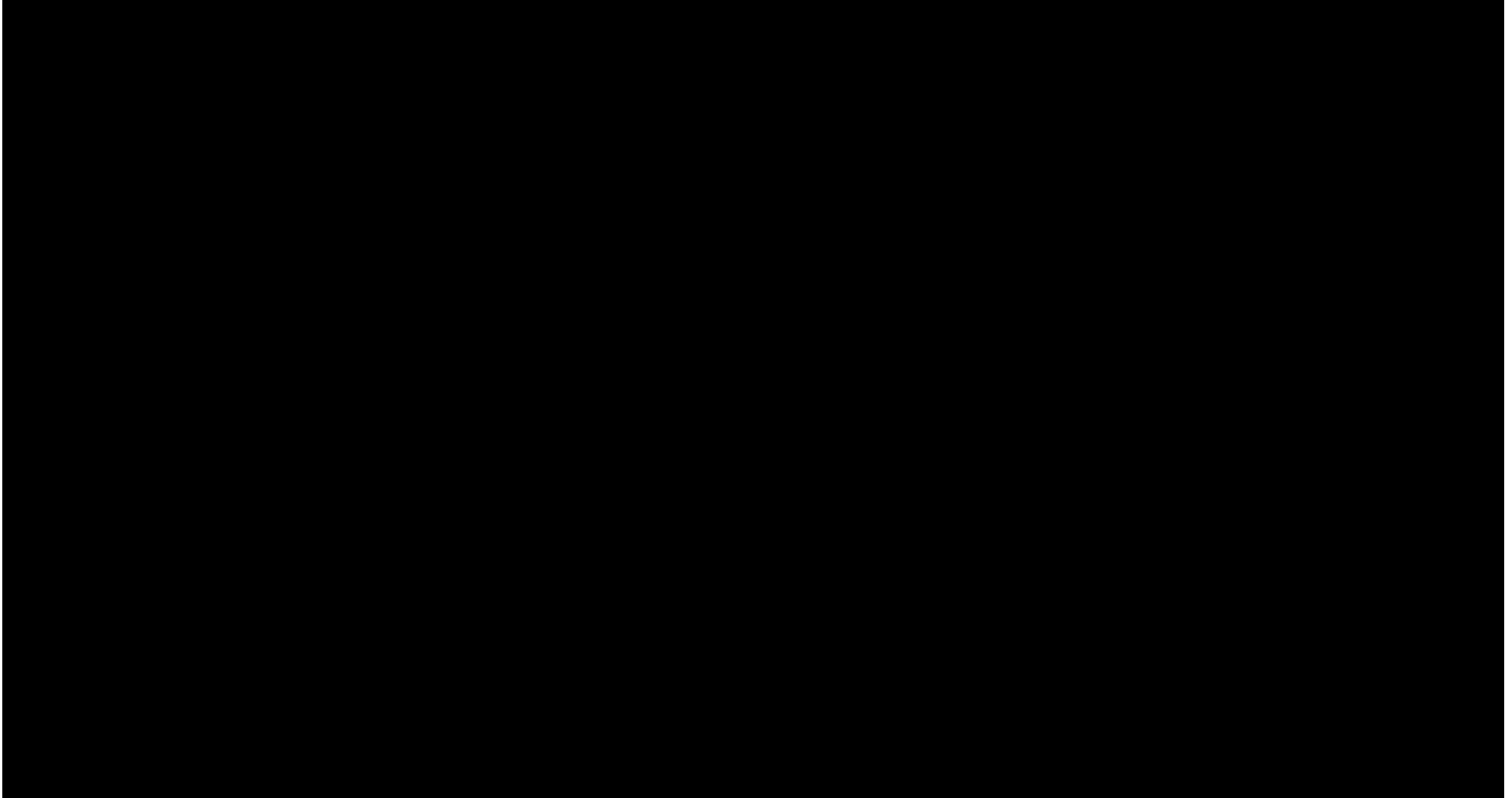
ICT capital expenditure as a % of corporate capital expenditure



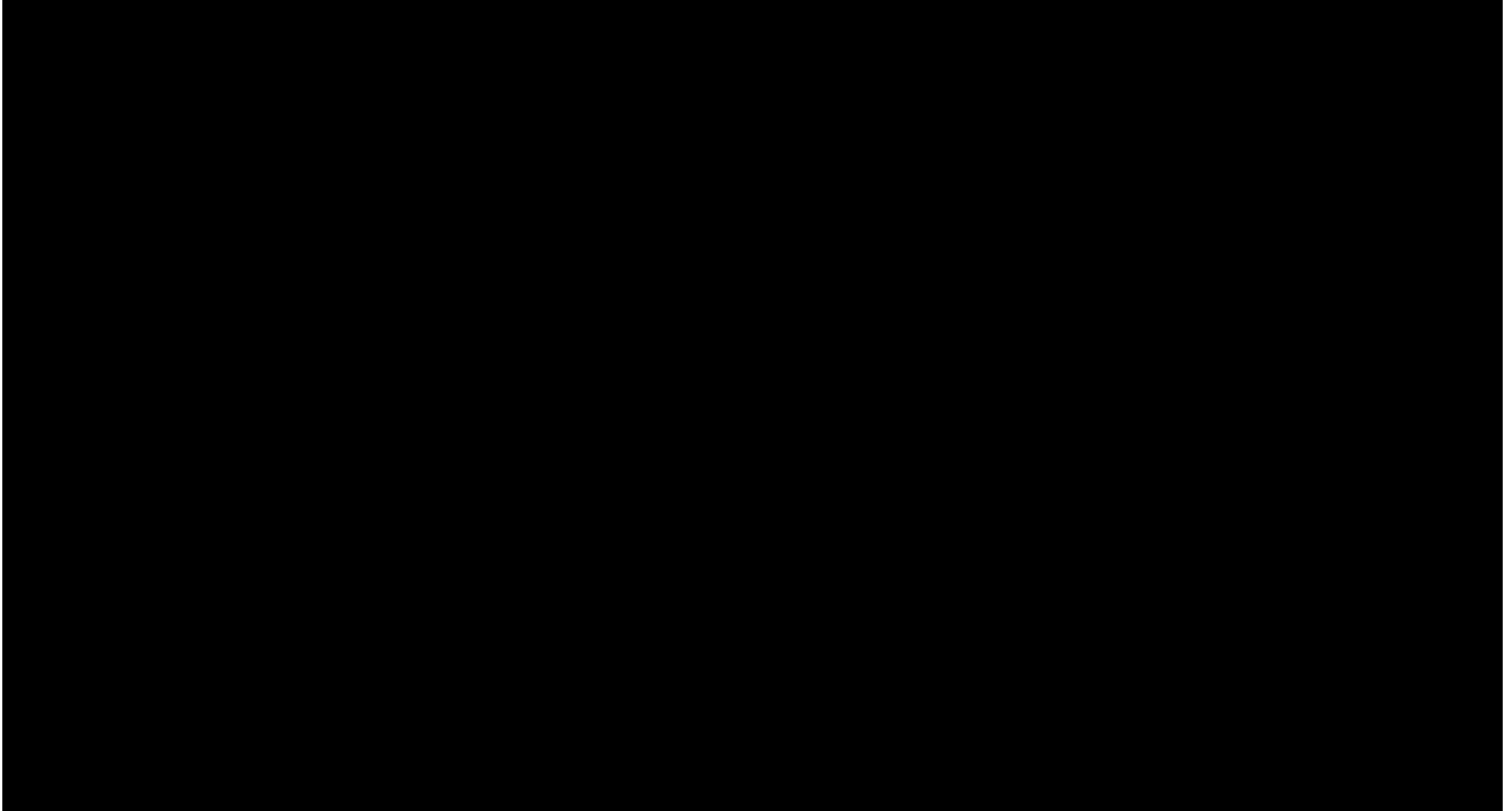
ICT asset value as a % of total corporate asset value



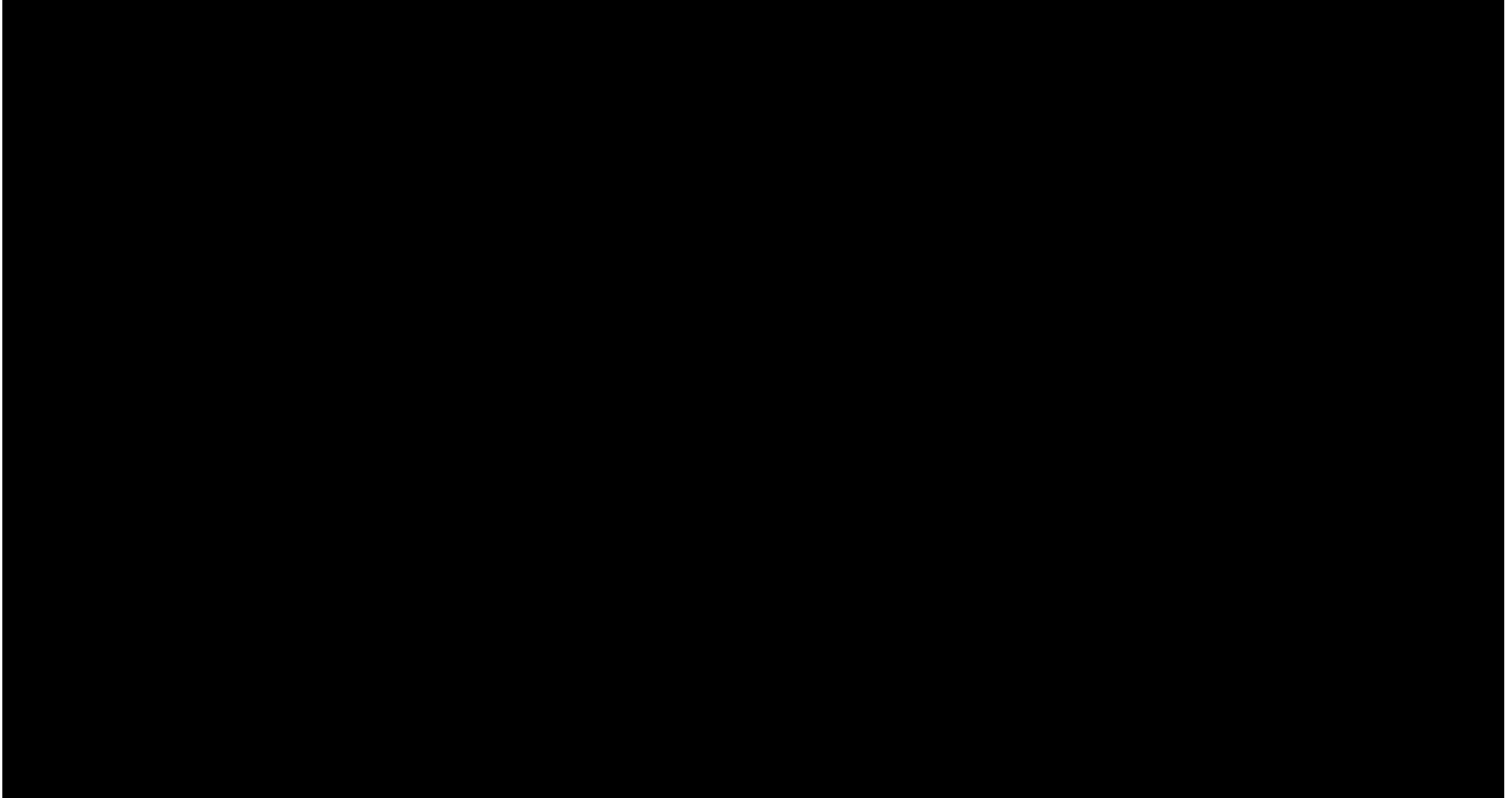
OT operating expenditure (excluding depreciation) as a % of corporate operating expenditure



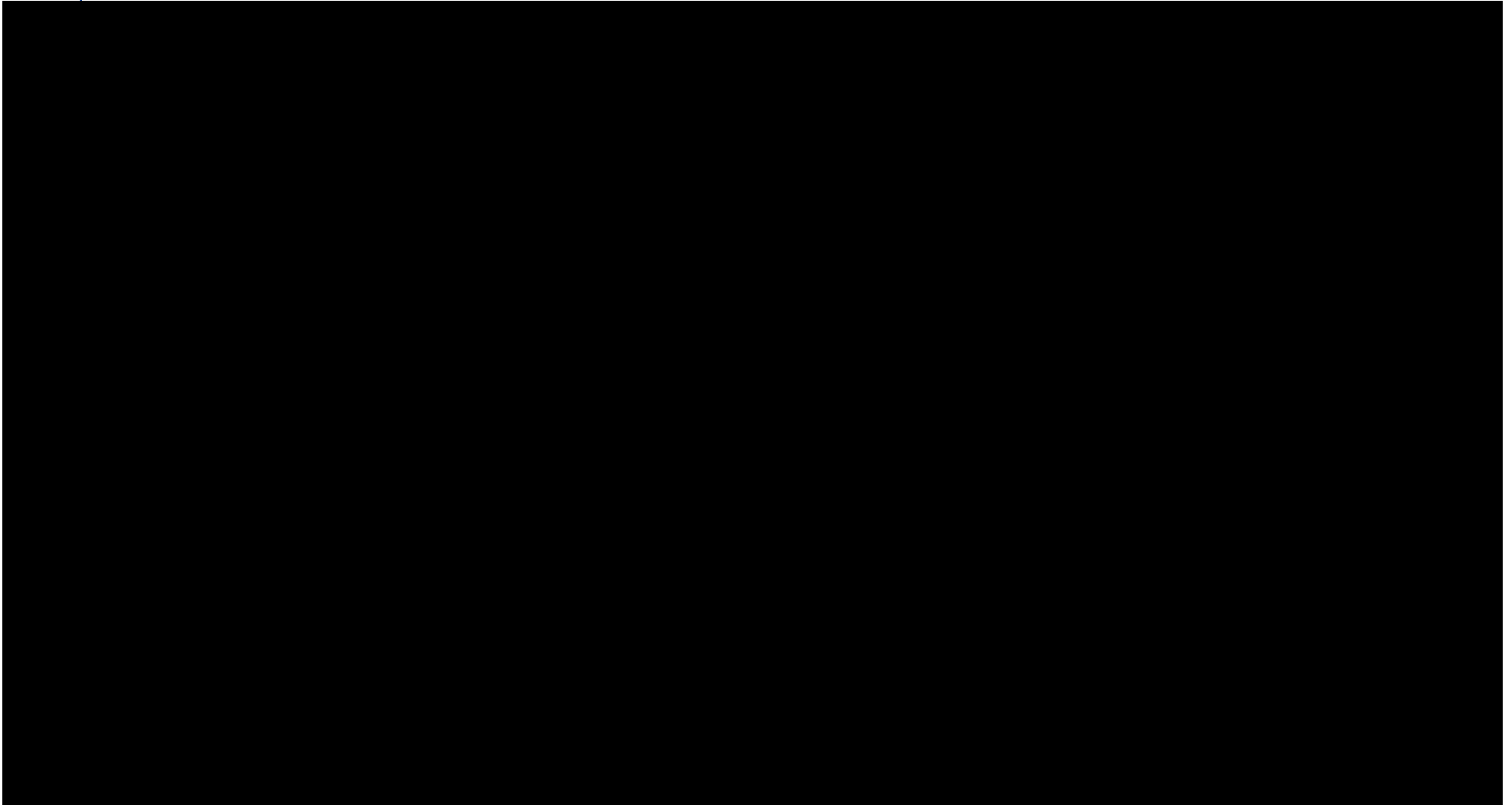
OT capital expenditure as a % of corporate capital expenditure



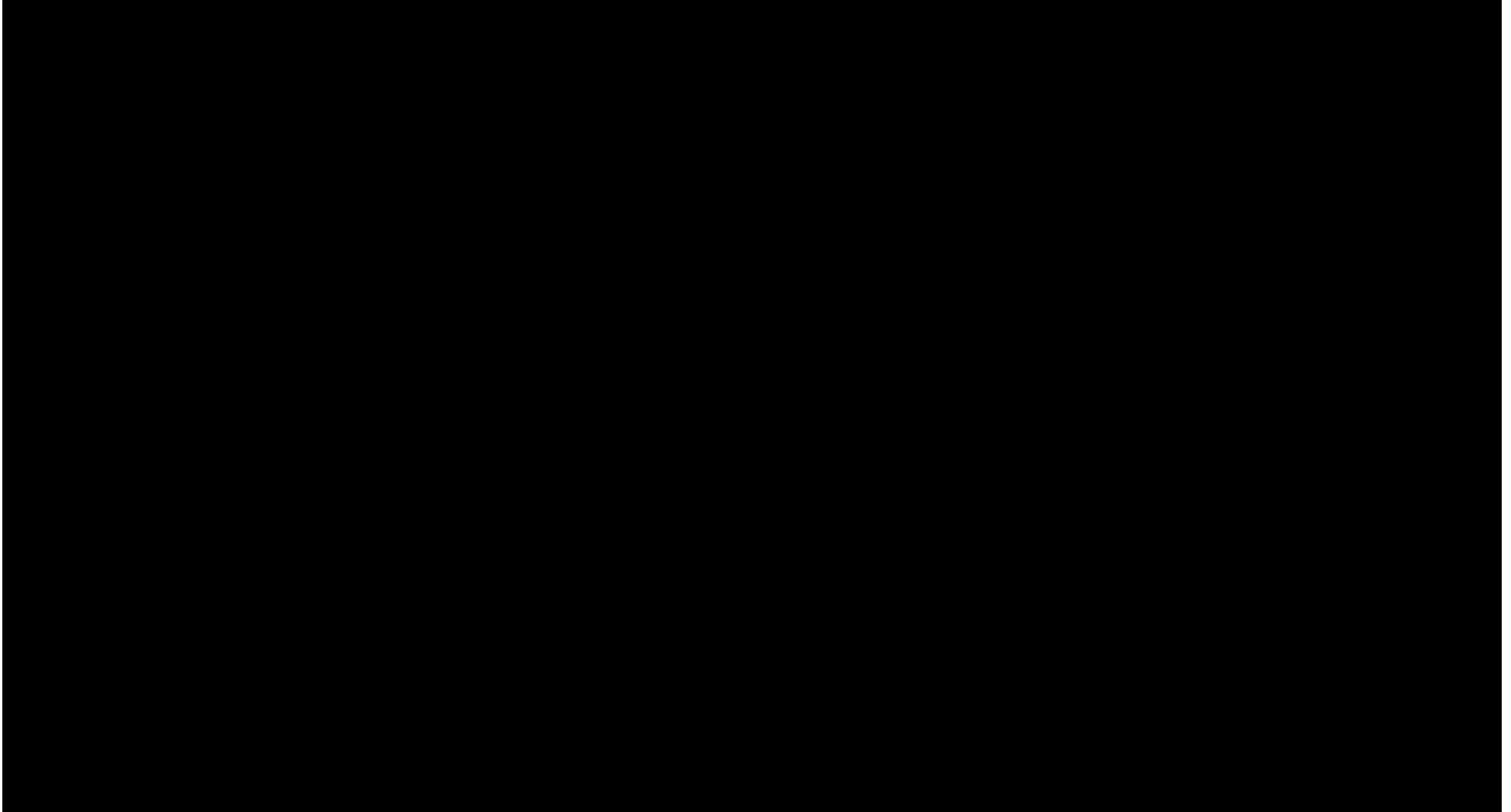
Metering Technology operating expenditure (excluding depreciation) as a % of corporate operating expenditure



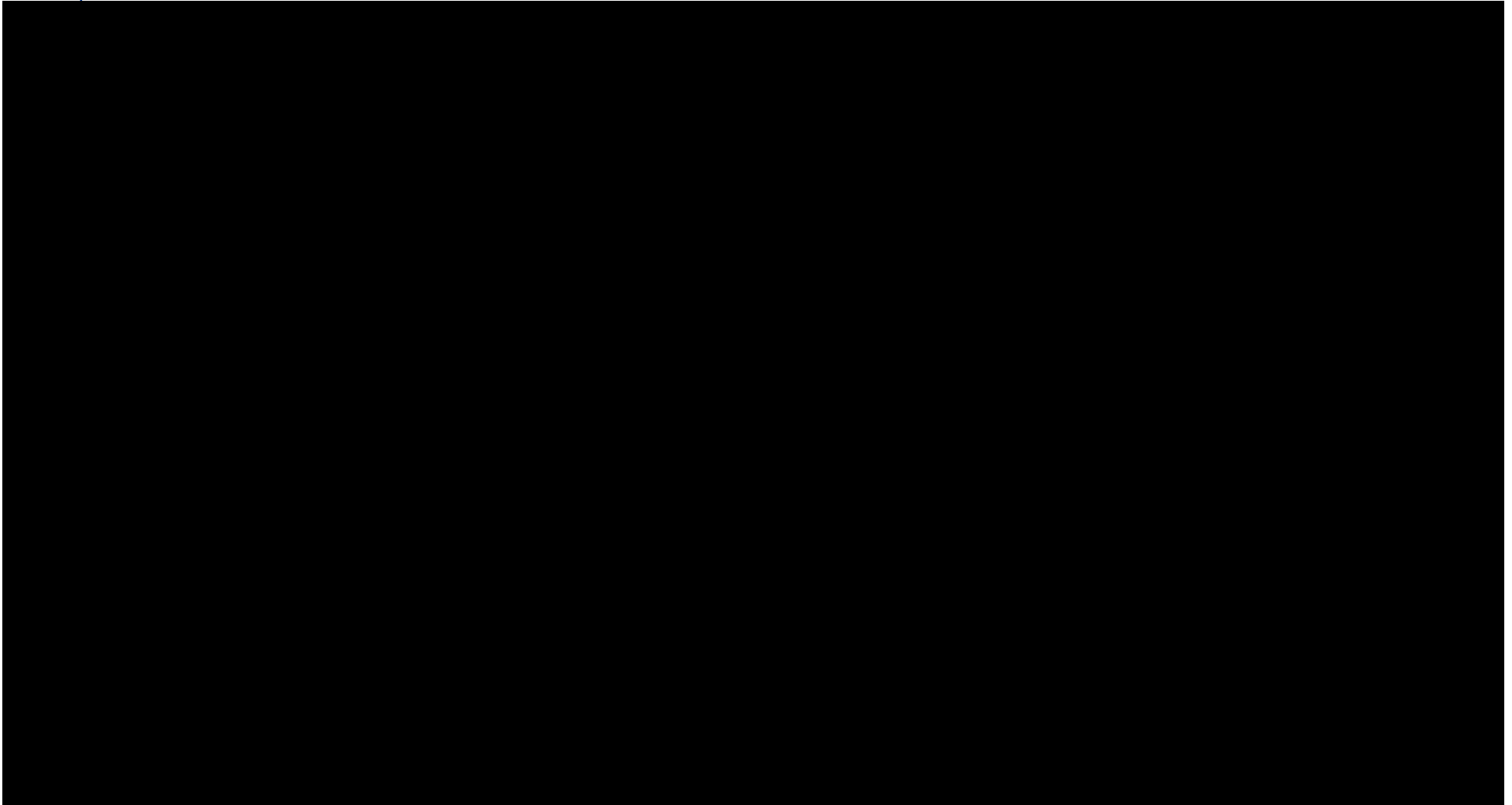
Metering Technology capital expenditure as a % of corporate capital expenditure



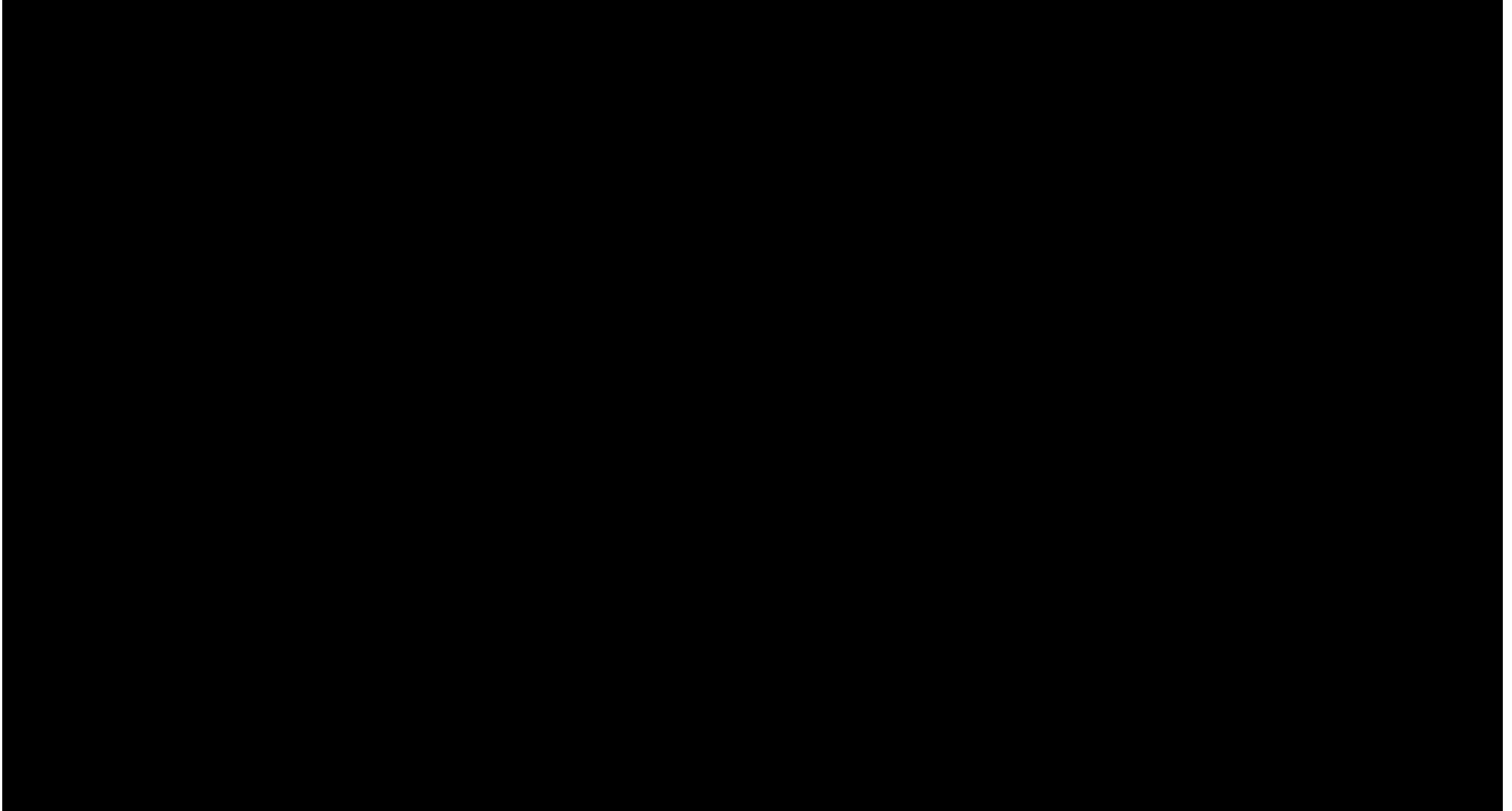
ICT depreciation as a % of ICT asset value



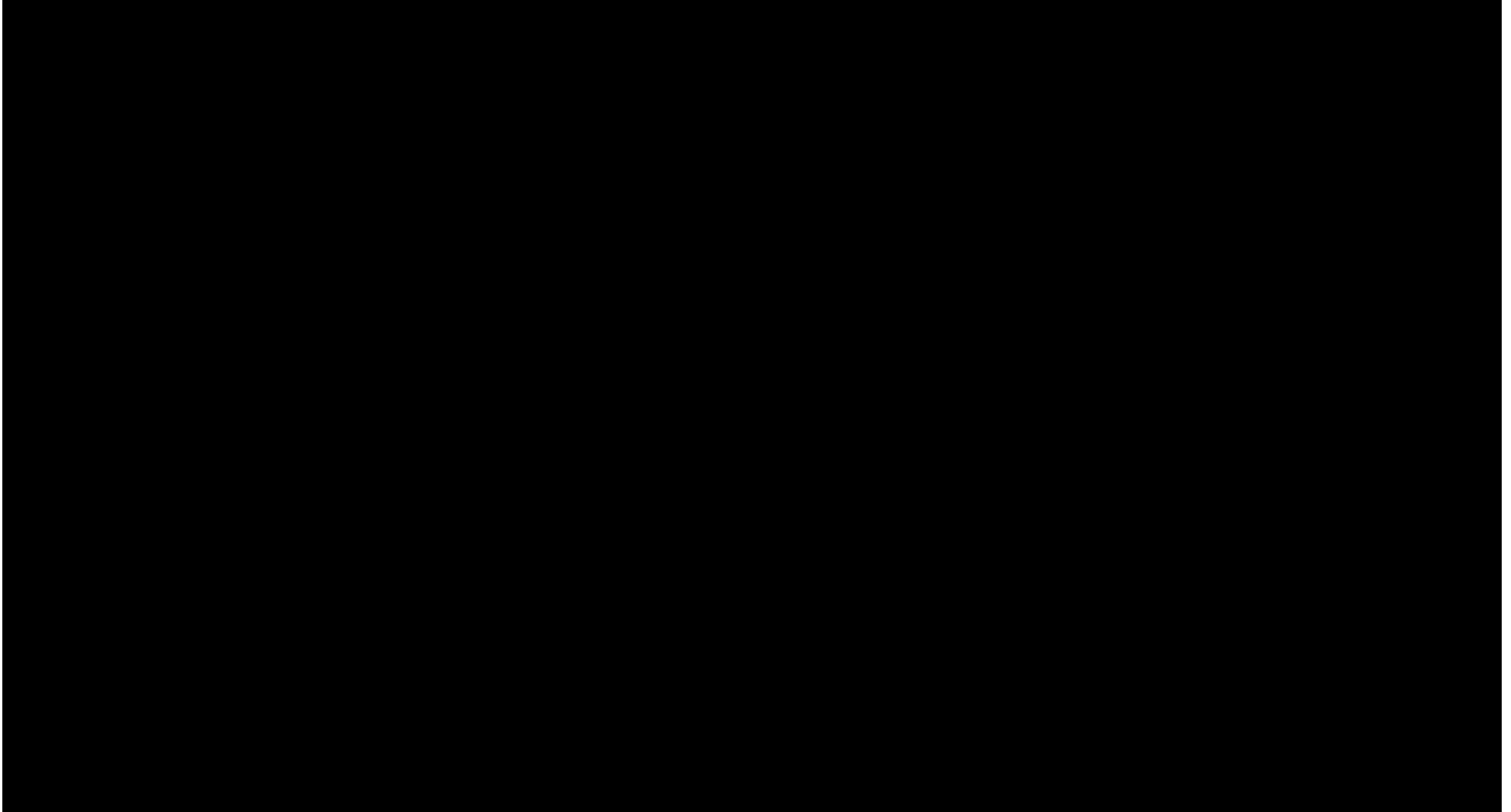
Digital security operating expenditure as a % of corporate operating expenditure



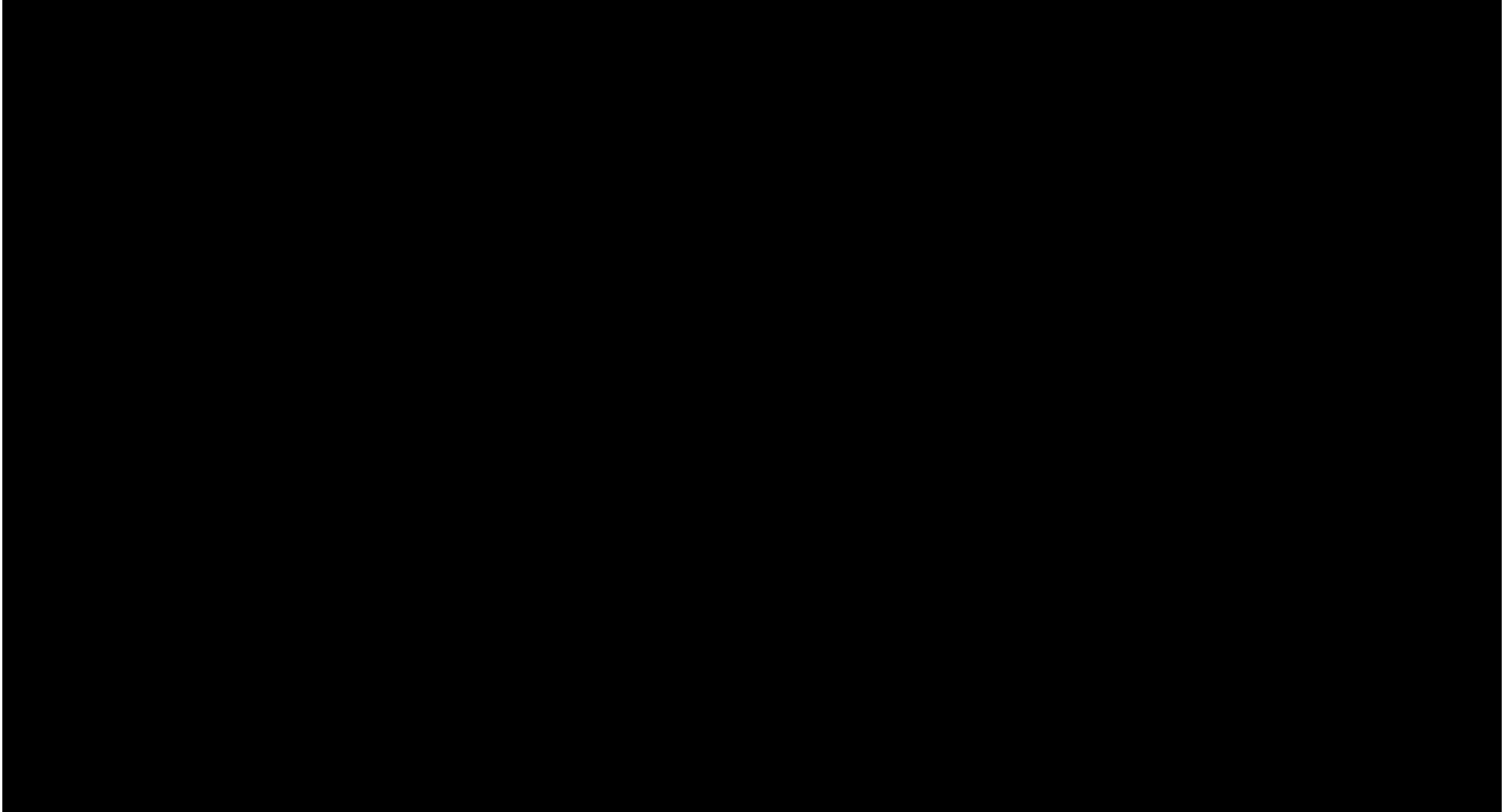
Digital security capital expenditure as a % of corporate capital expenditure



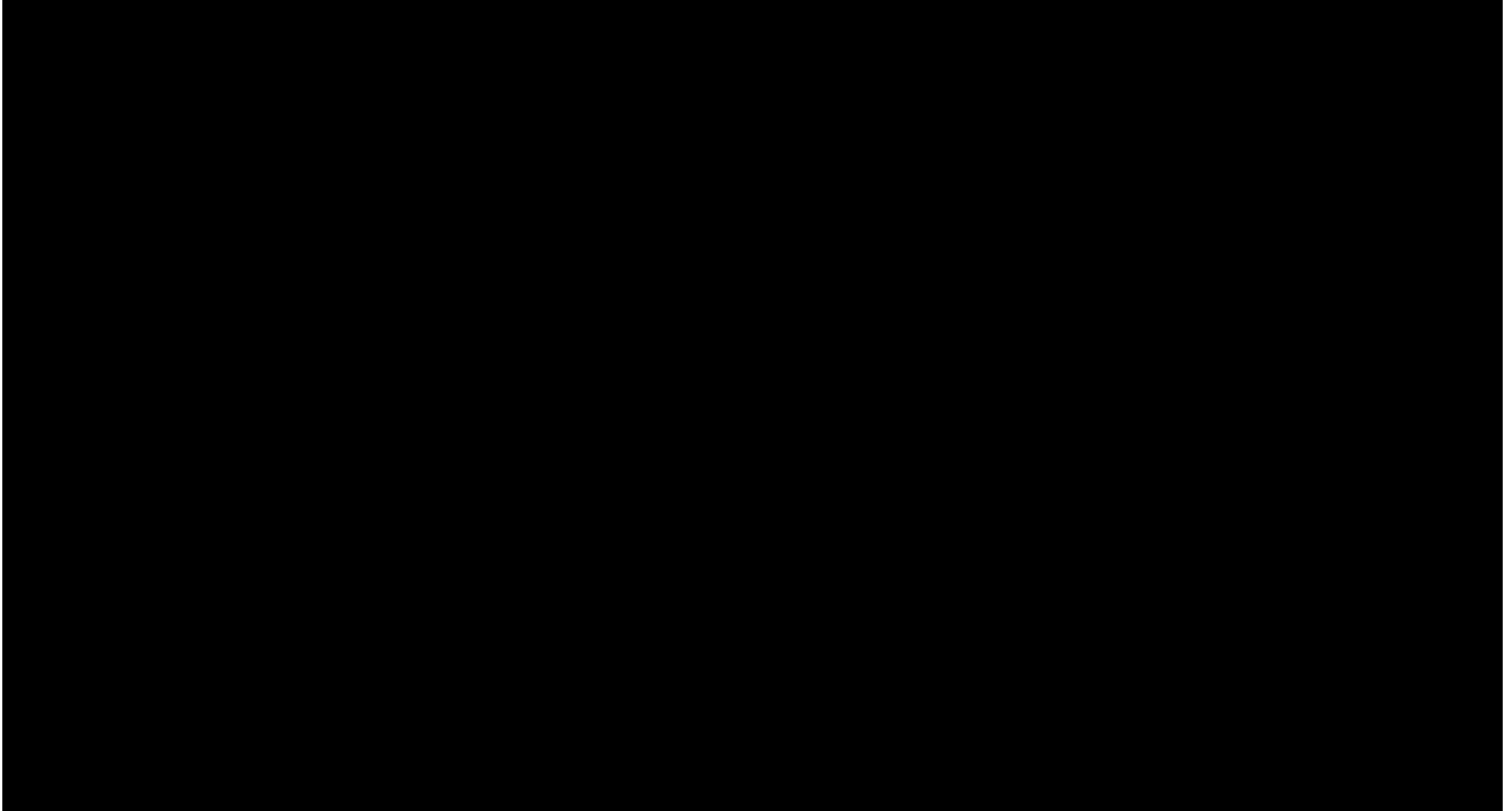
Innovation operating expenditure as a % of corporate operating expenditure



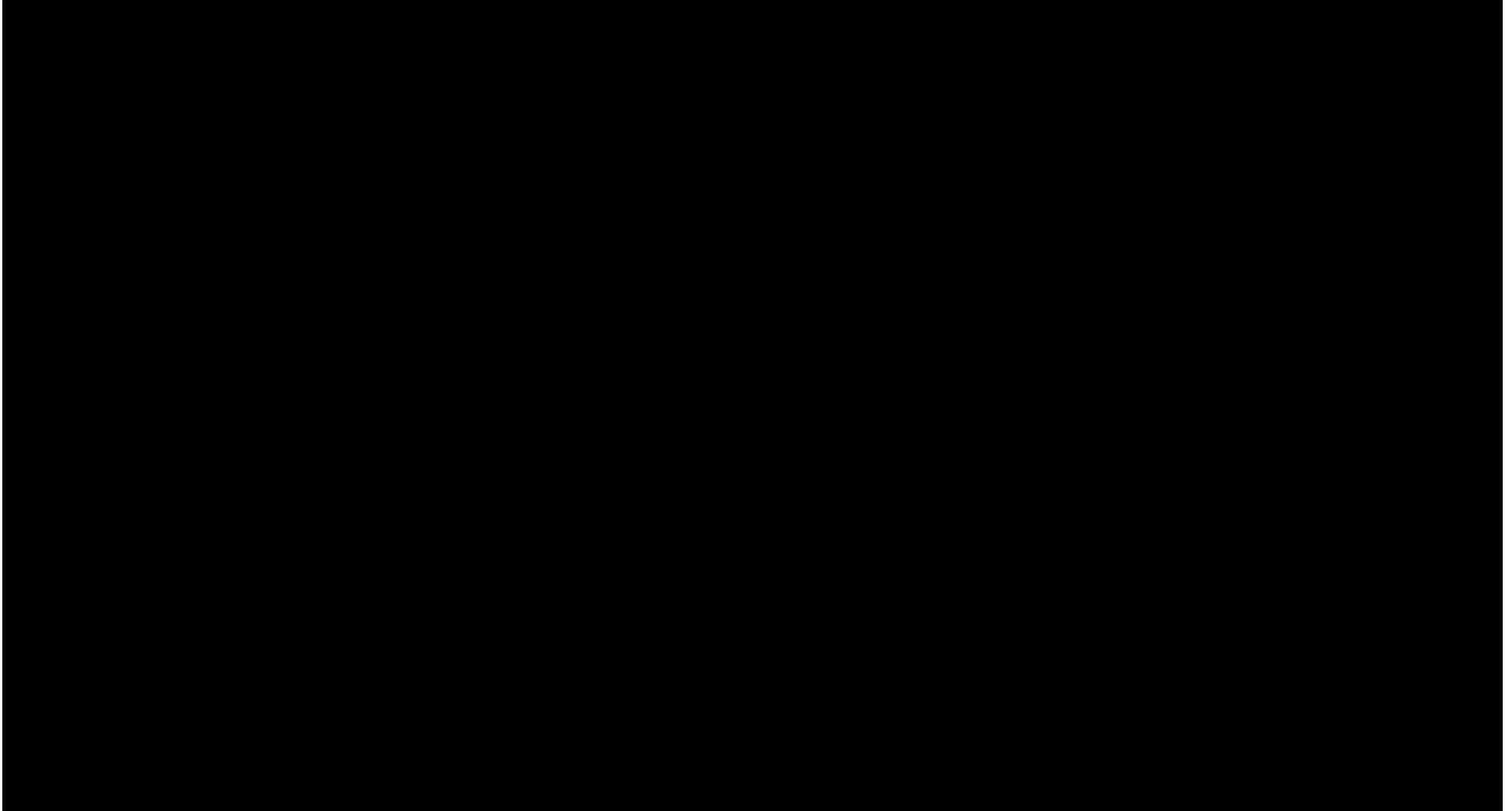
Innovation capital expenditure as a % of corporate capital expenditure



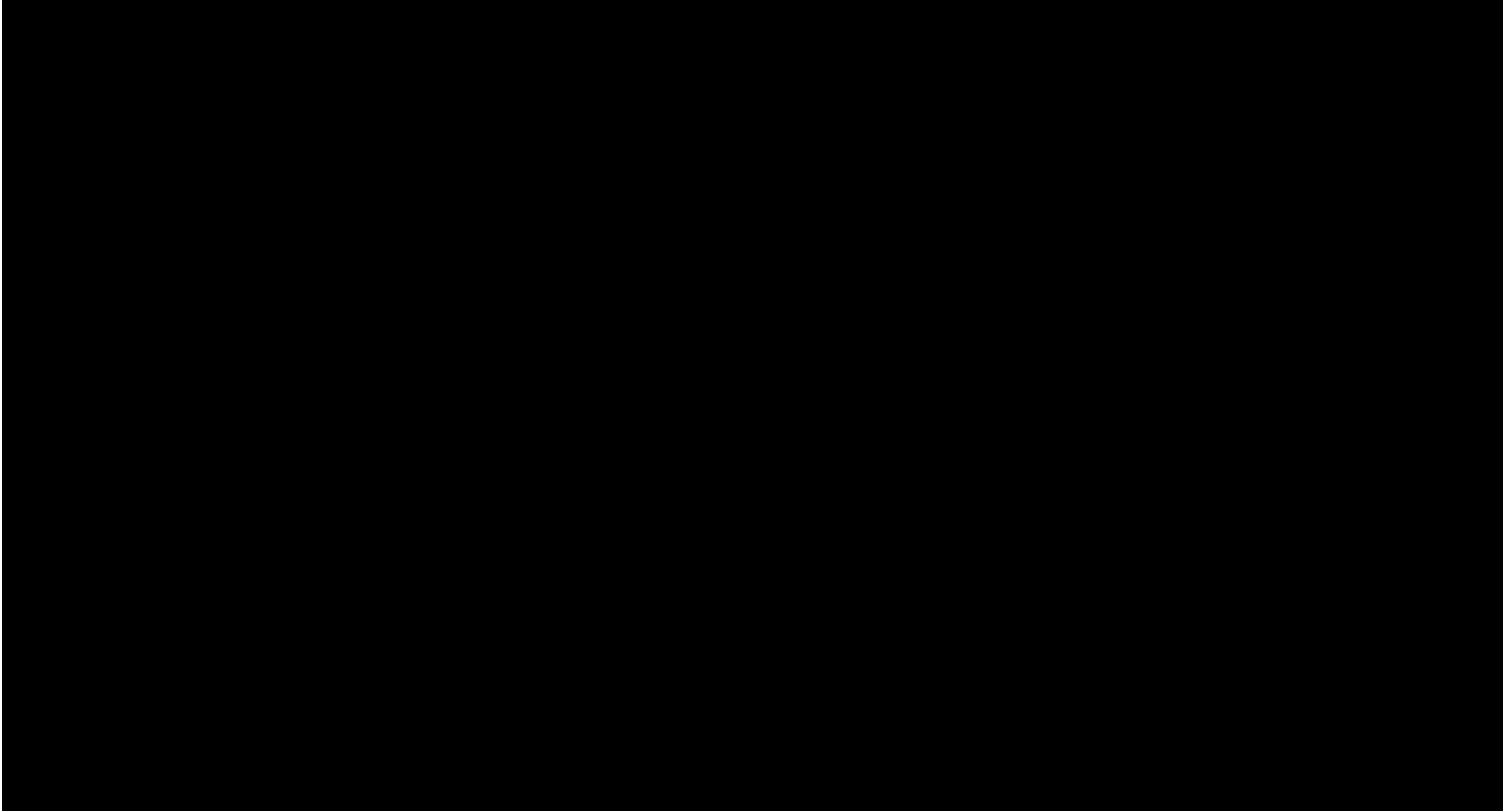
Corporate totex per corporate customer



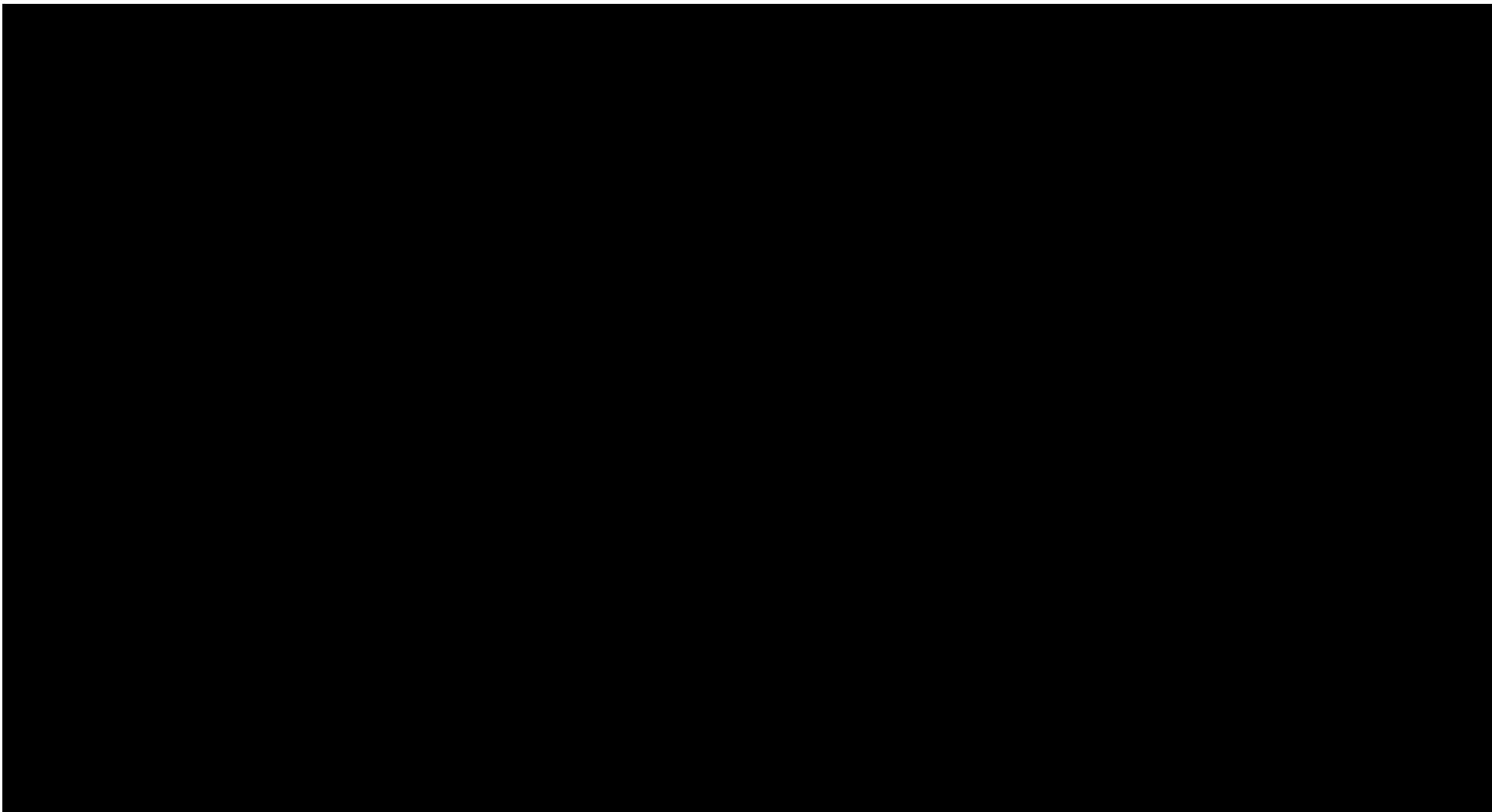
Corporate totex per organisation personnel



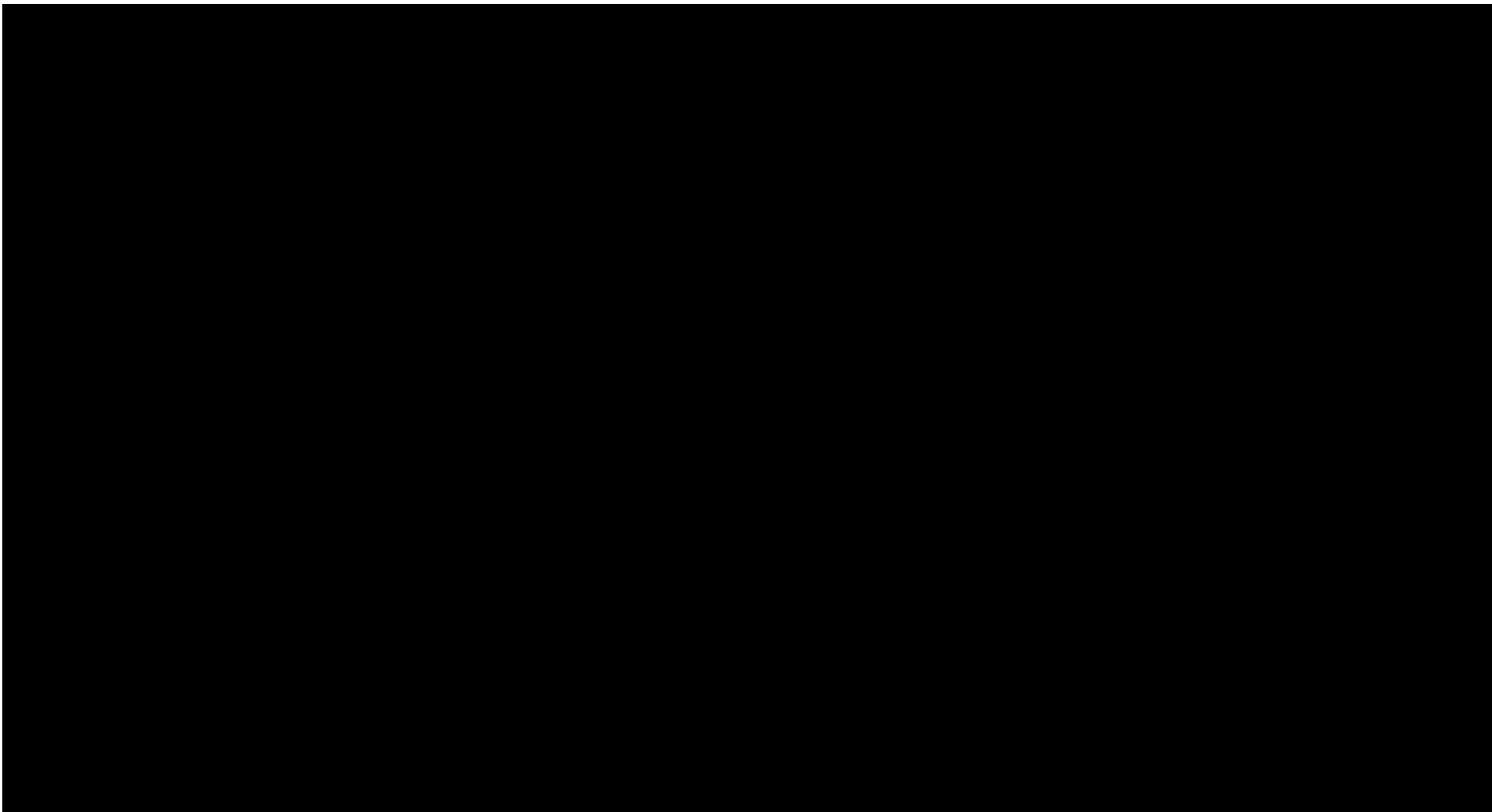
ICT totex as a % of corporate totex



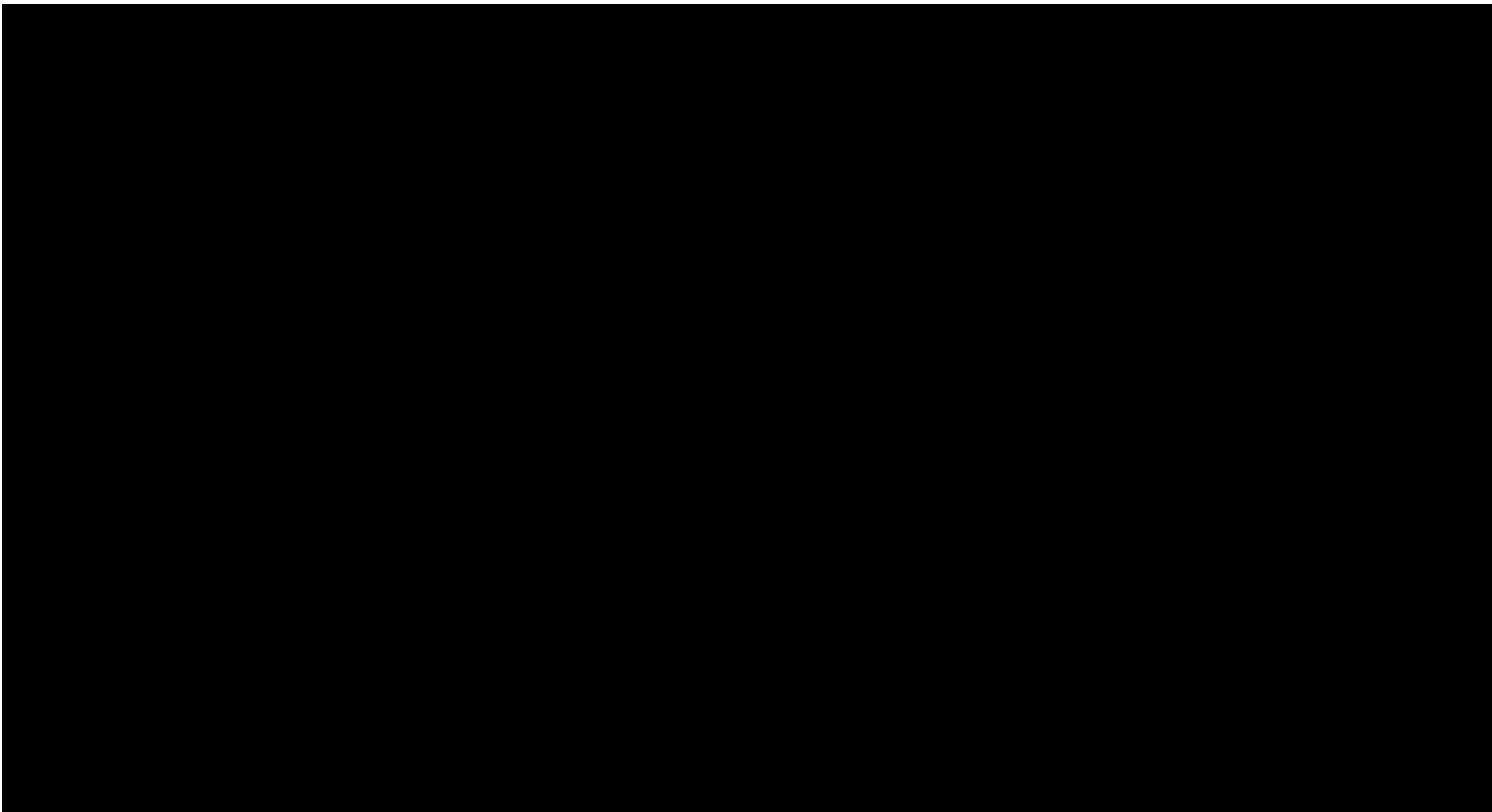
ICT totex per corporate customer



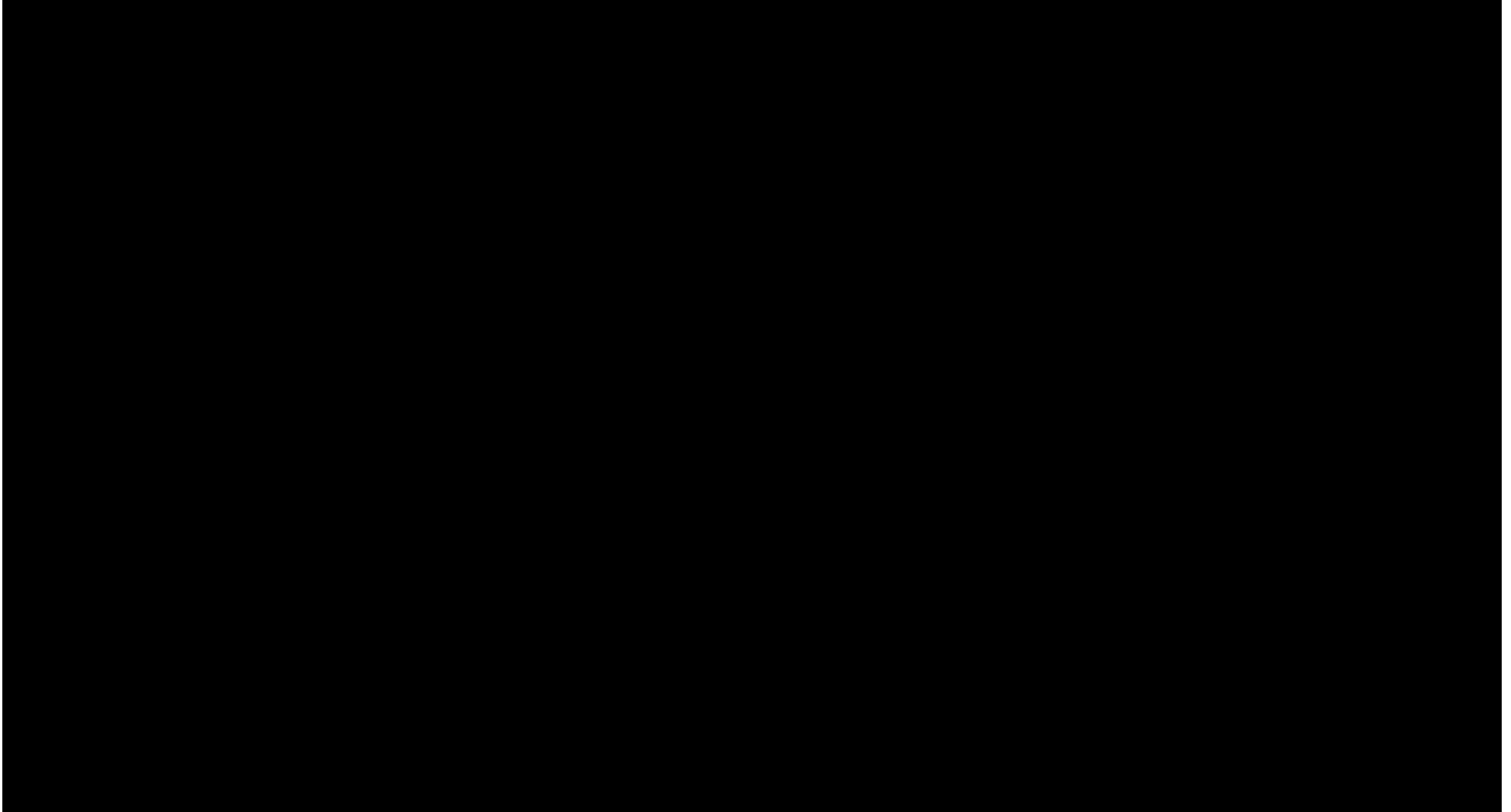
ICT totex per organisational personnel



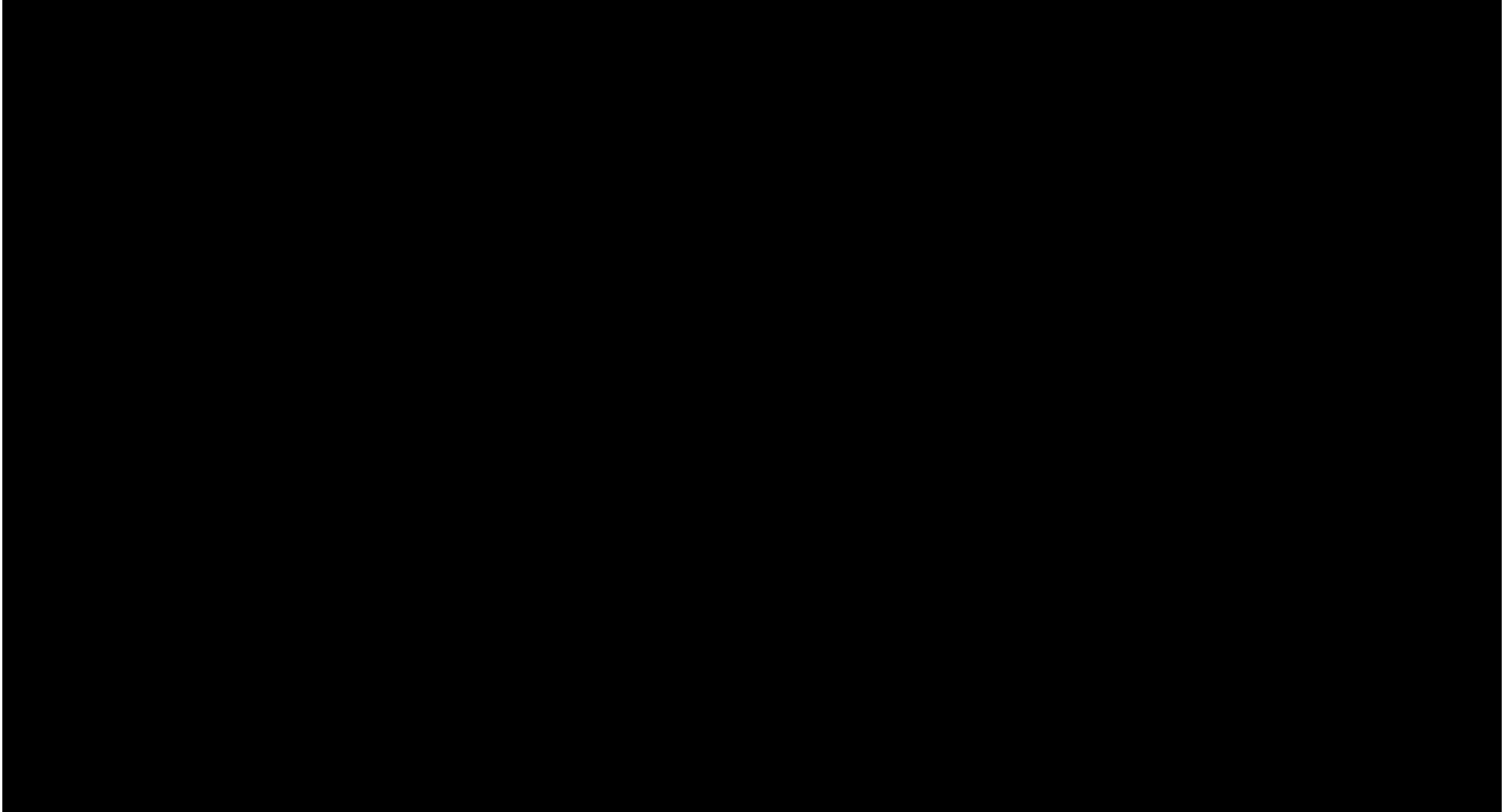
ICT totex per ICT personnel



Technology domain breakdown of total ICT opex



Technology domain breakdown of total ICT capex



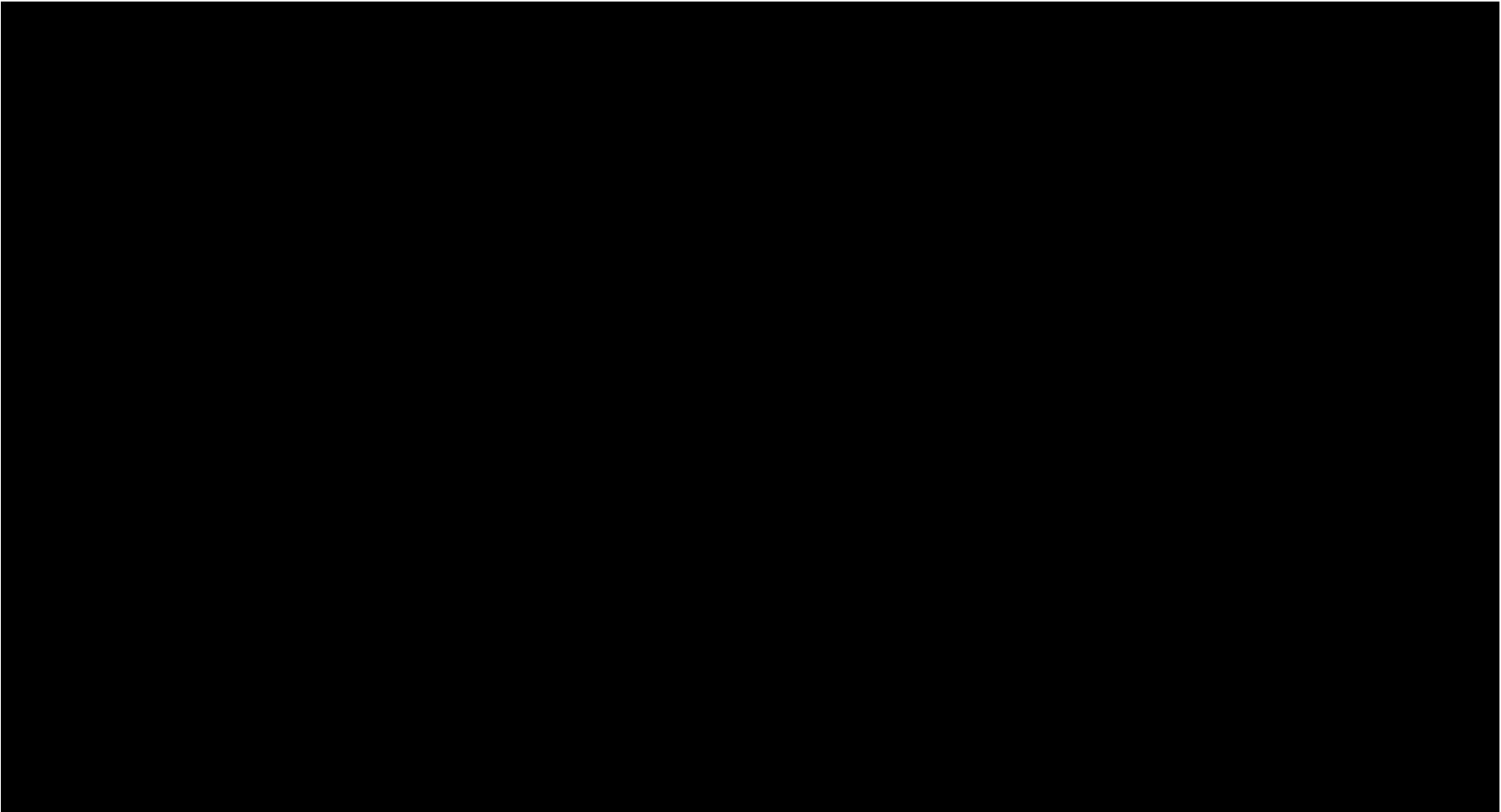


Corporate Information & Communications Technology Benchmarks

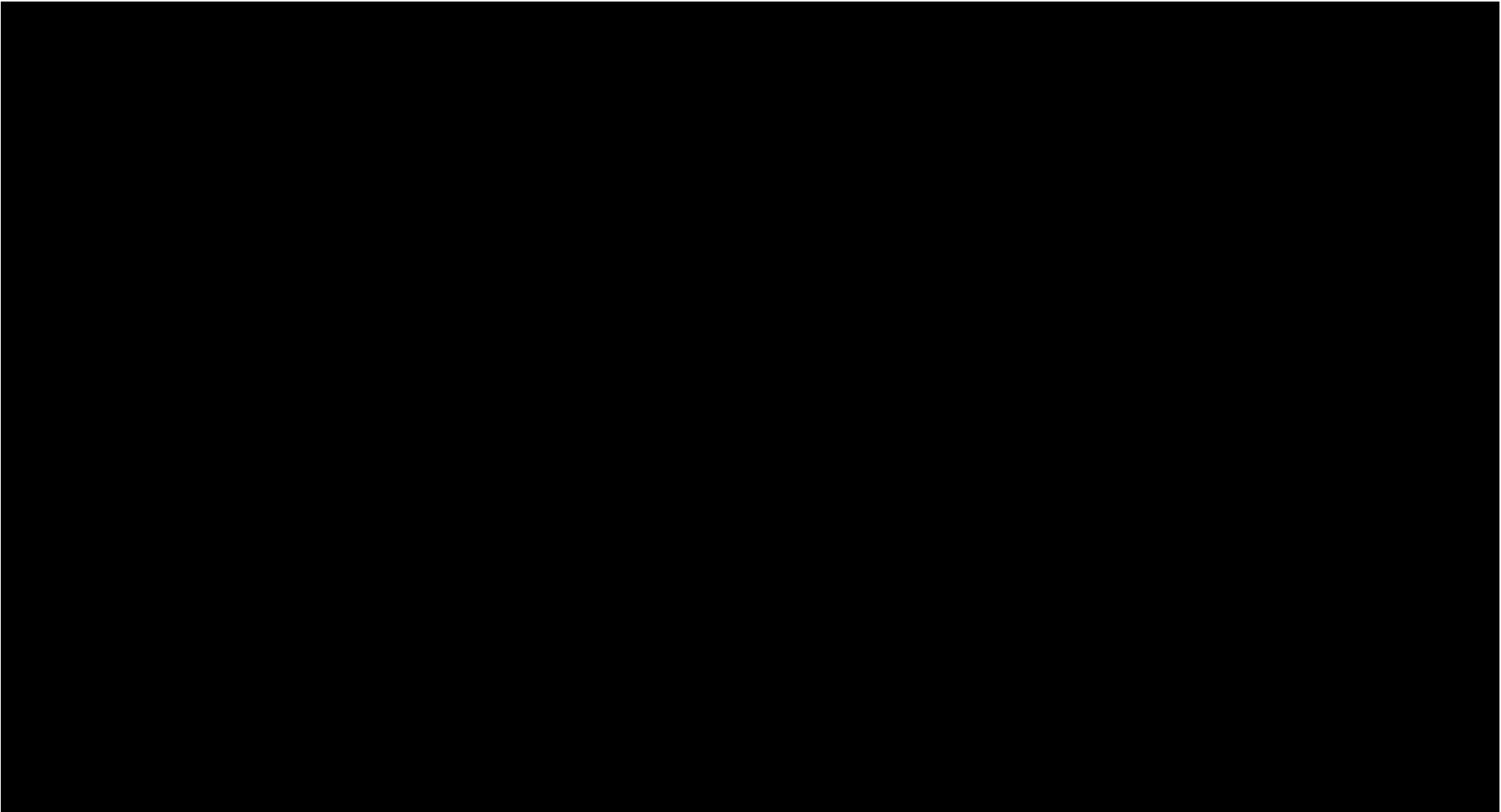
Resource Metrics

- Category breakdown of ICT staff,
- Total ICT staff as a % of corporate staff, and
- Contractors as a % of total ICT staff.

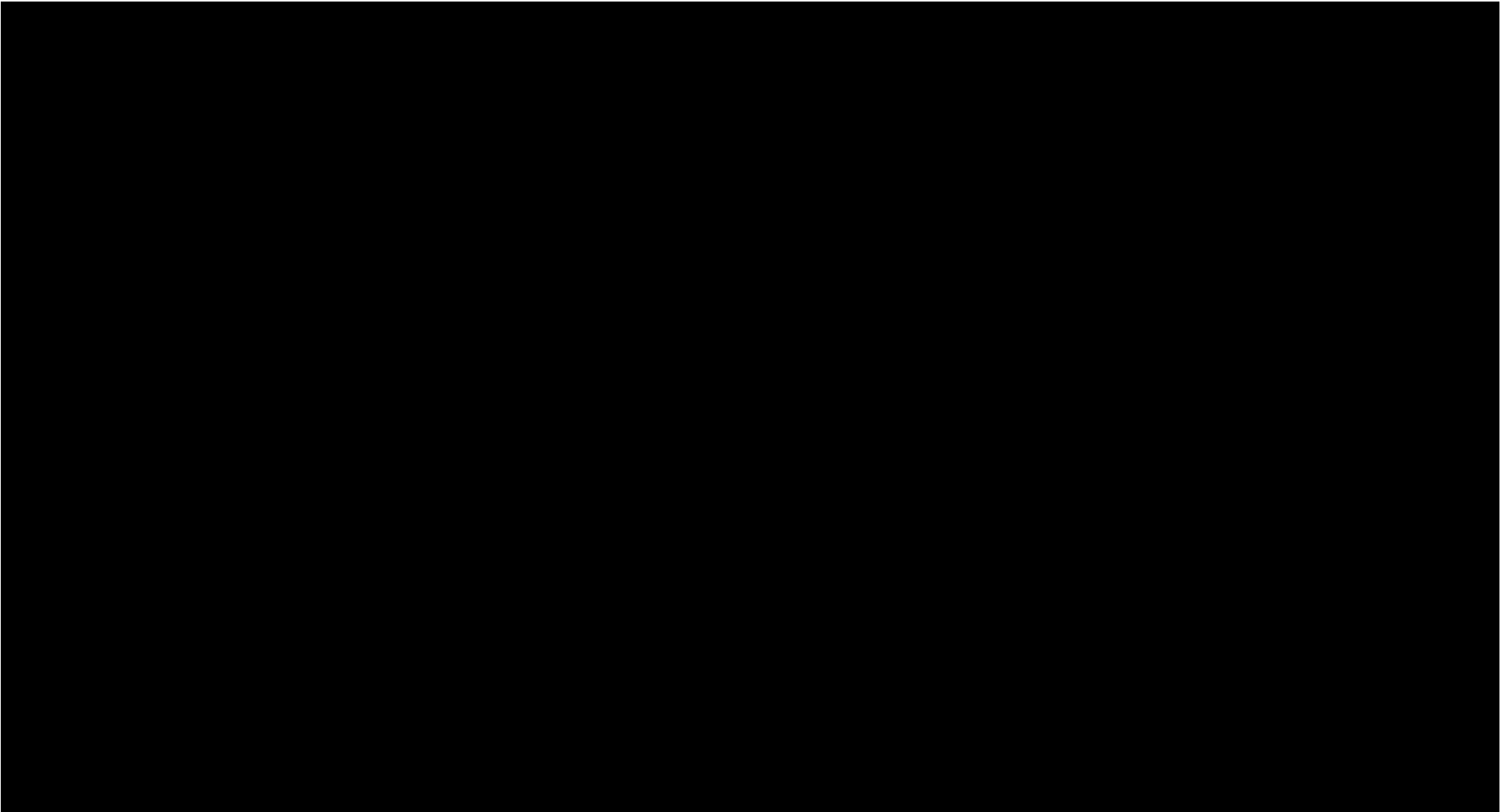
Category breakdown of ICT staff



Total ICT staff as a % of corporate staff



Contractors as a % of total ICT staff



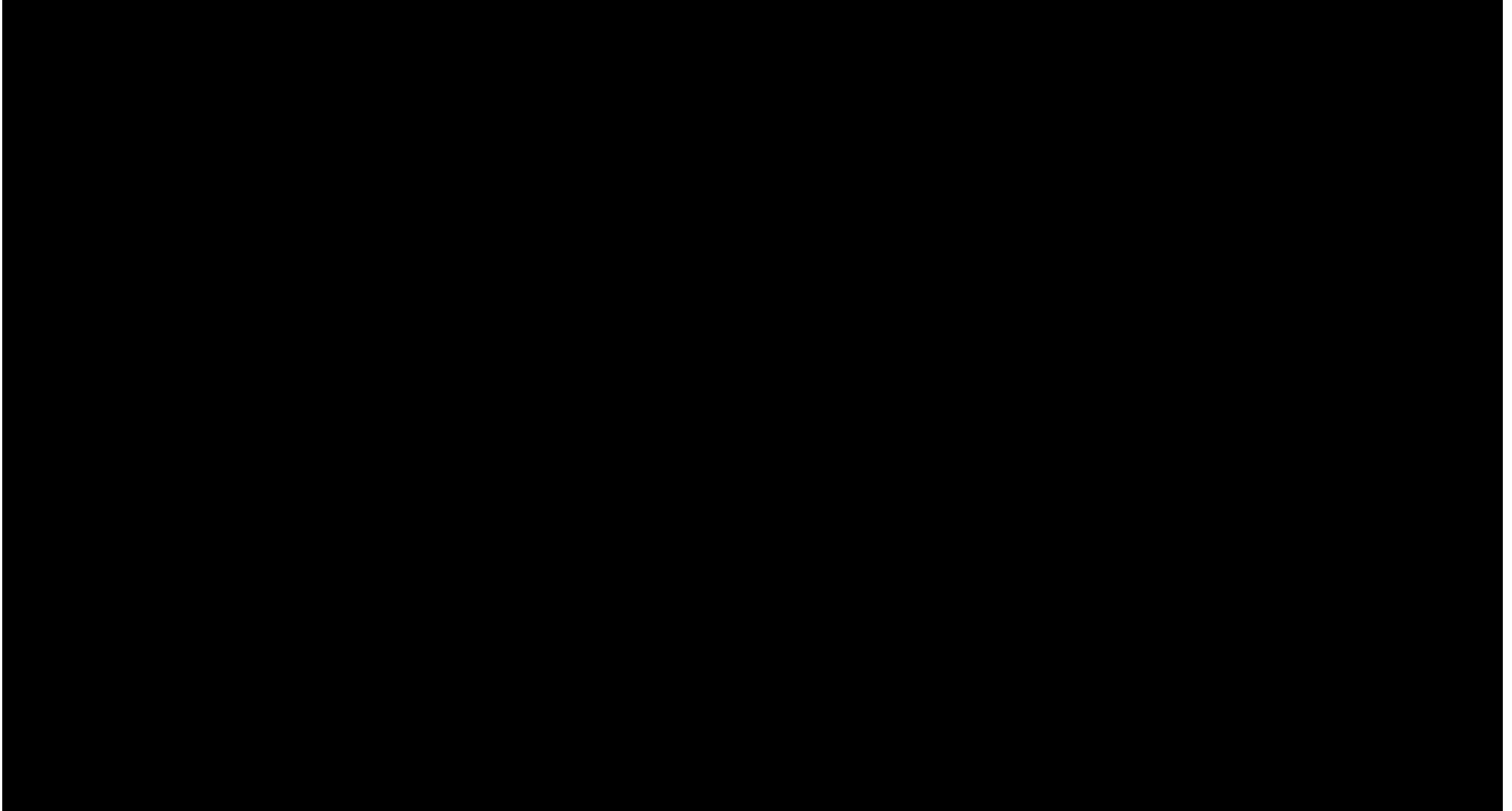


Corporate Information & Communications Technology Benchmarks

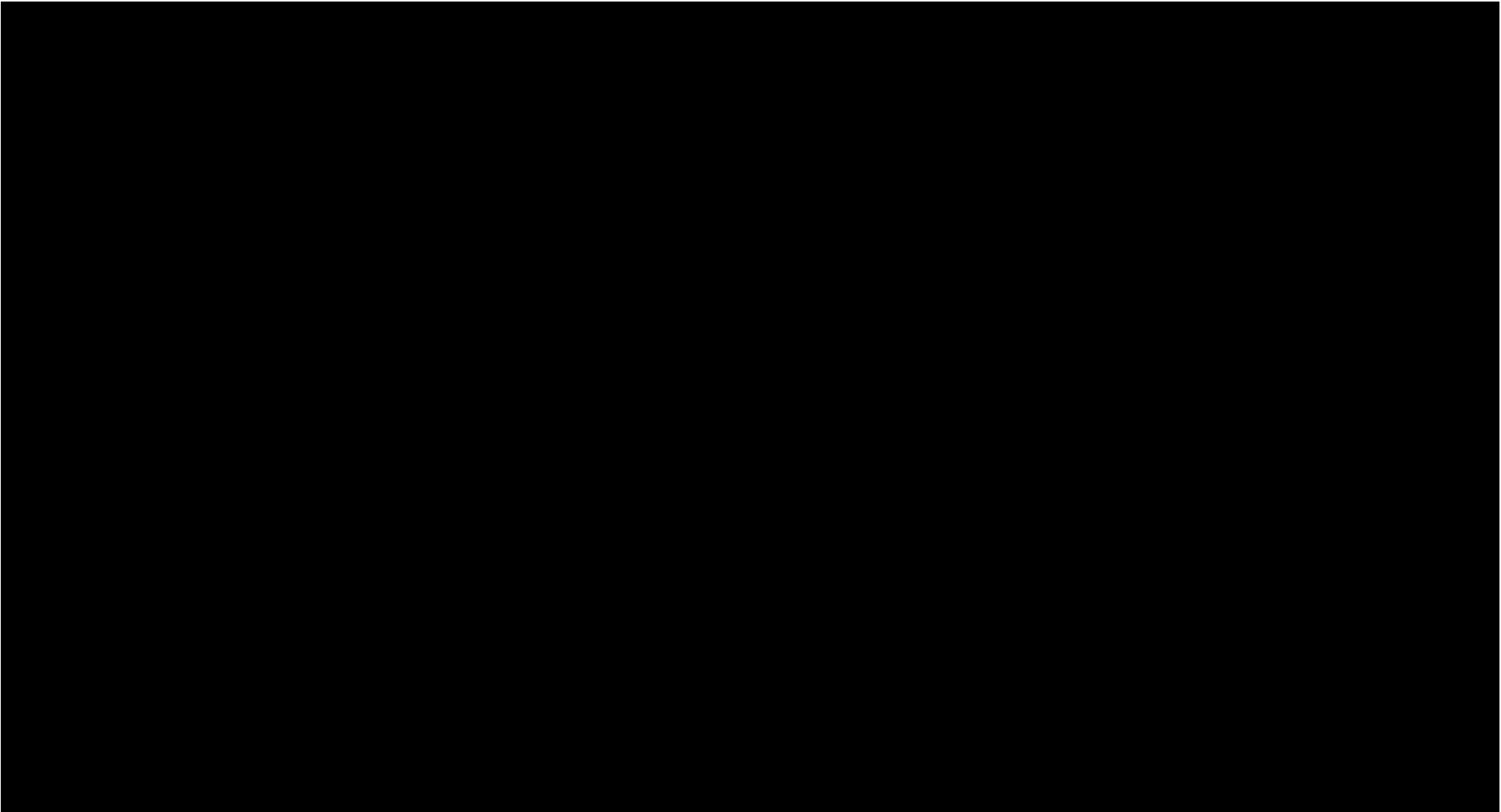
Hardware Metrics

- Category breakdown of client devices,
- Ratio of organisation staff to client and peripheral devices, and
- Annual support expenditure per client & peripheral device.

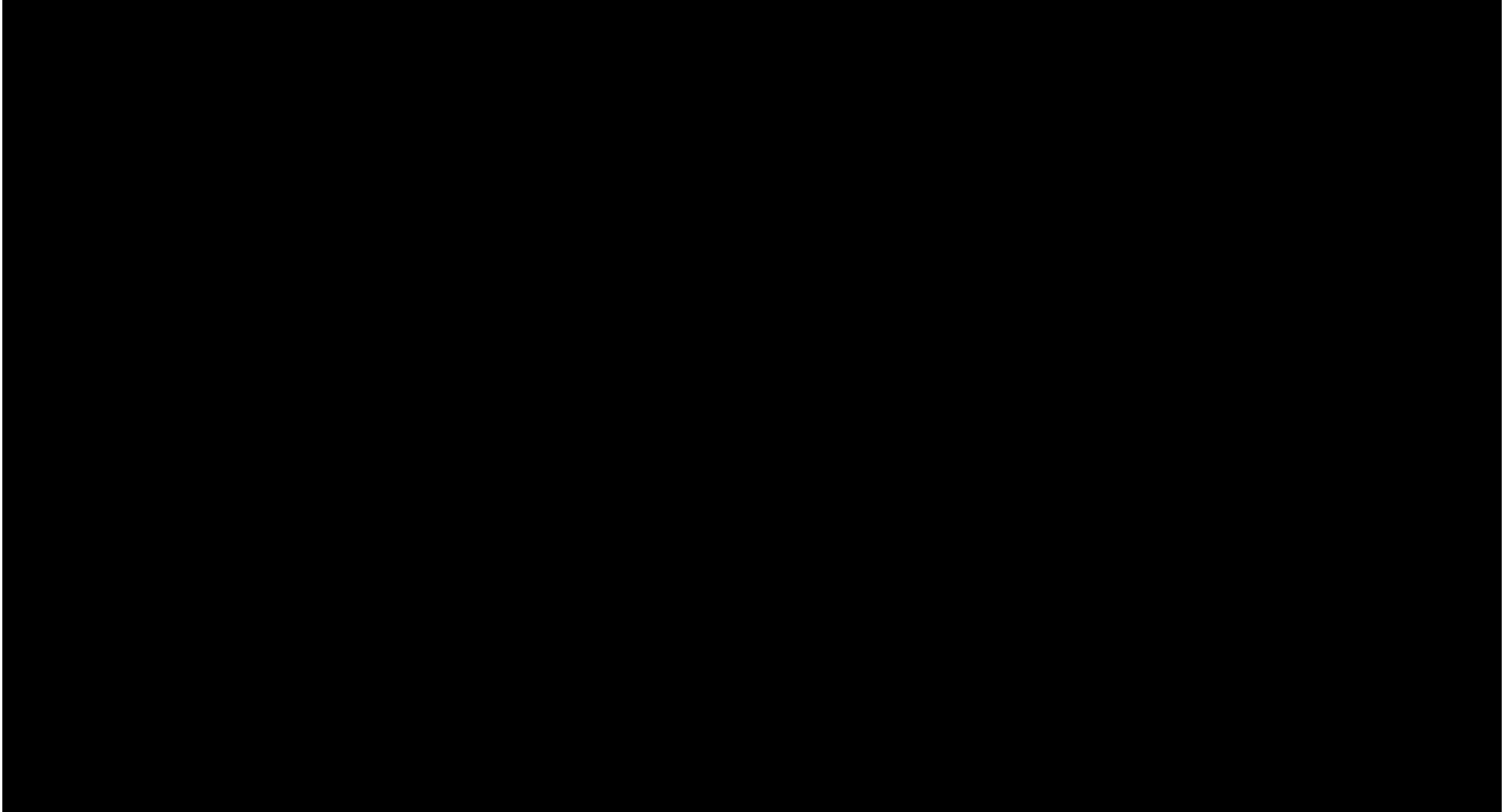
Category breakdown of client devices



Ratio of client and peripheral devices to organisation staff



Annual support expenditure per client & peripheral device



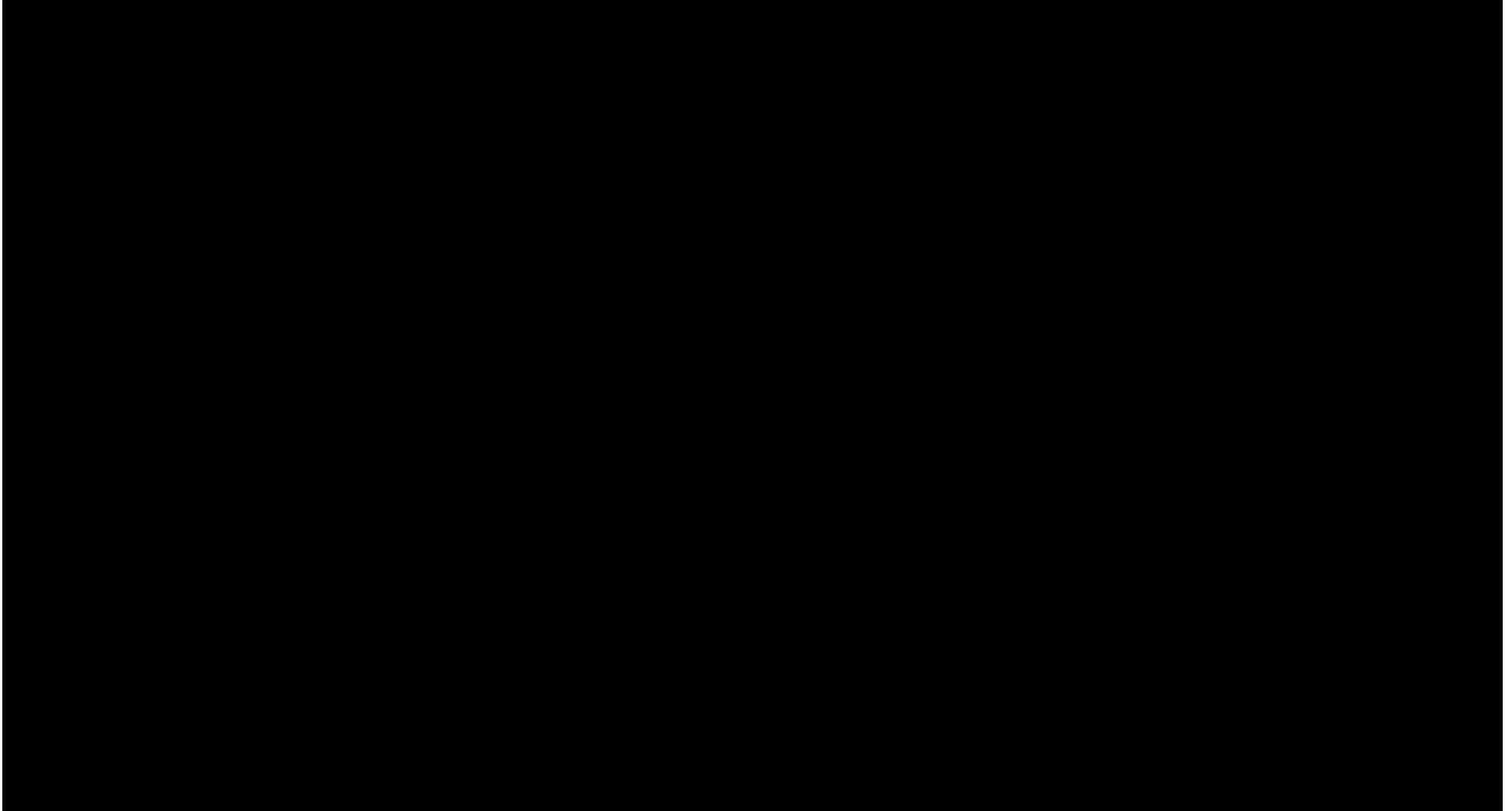


Corporate Information & Communications Technology Benchmarks

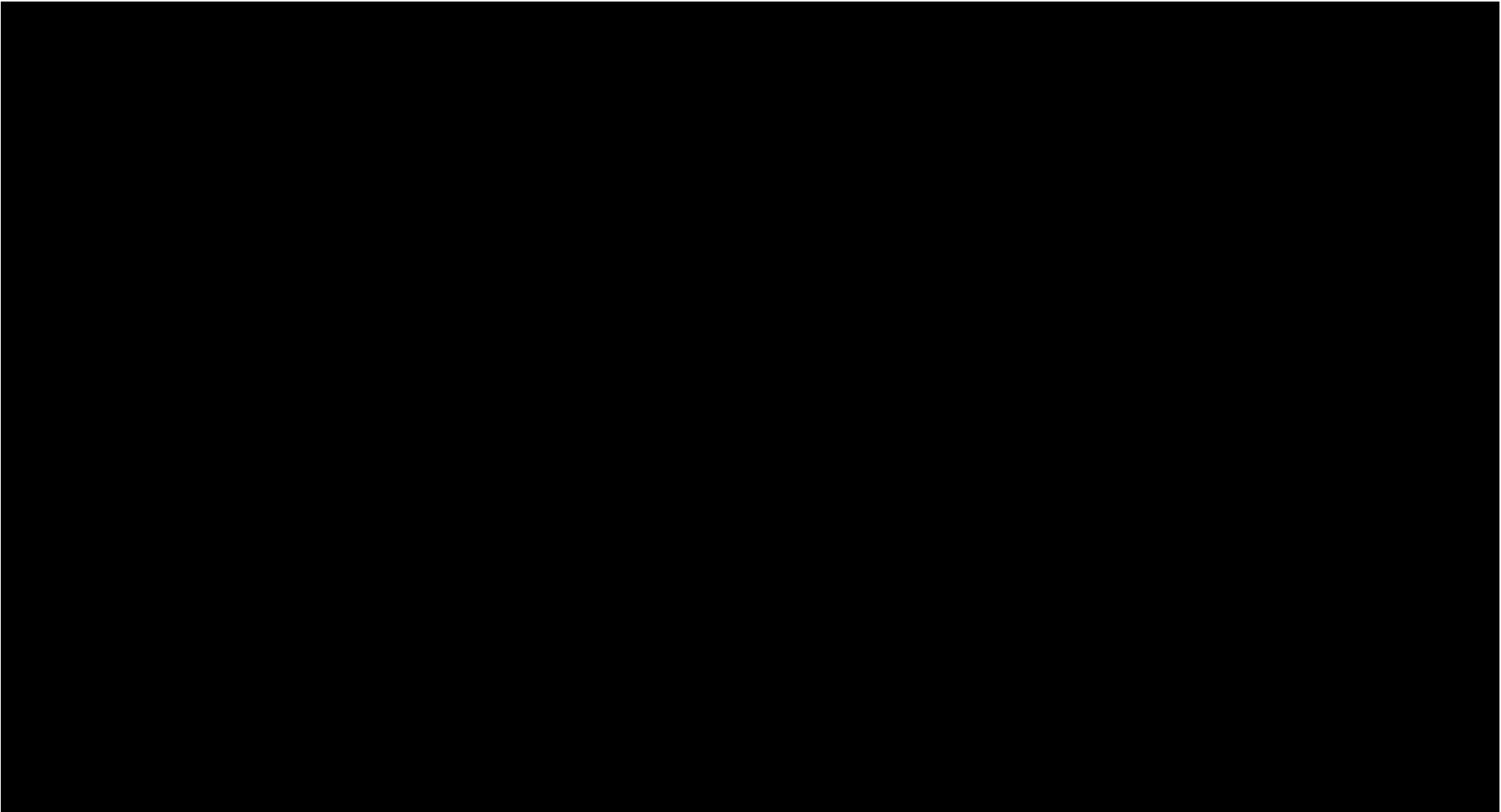
Service Delivery Metrics

- Average service desk usage per user per month,
- Service desk statistics – first call resolution rate, and
- Service desk statistics – average time to answer in seconds.

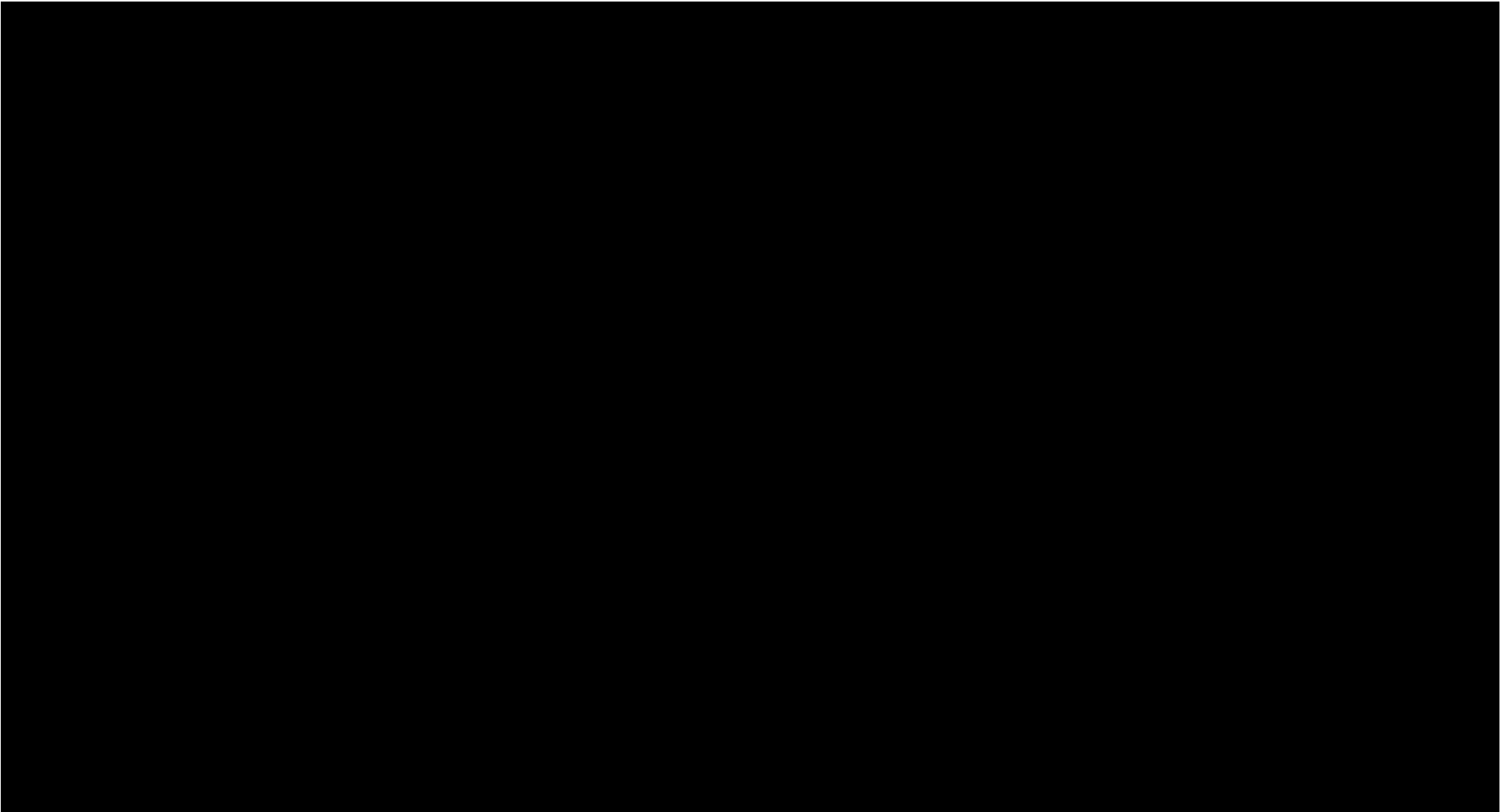
Average service desk usage per user per month



Service desk statistics – first call resolution rate



Service desk statistics - average time to answer in seconds



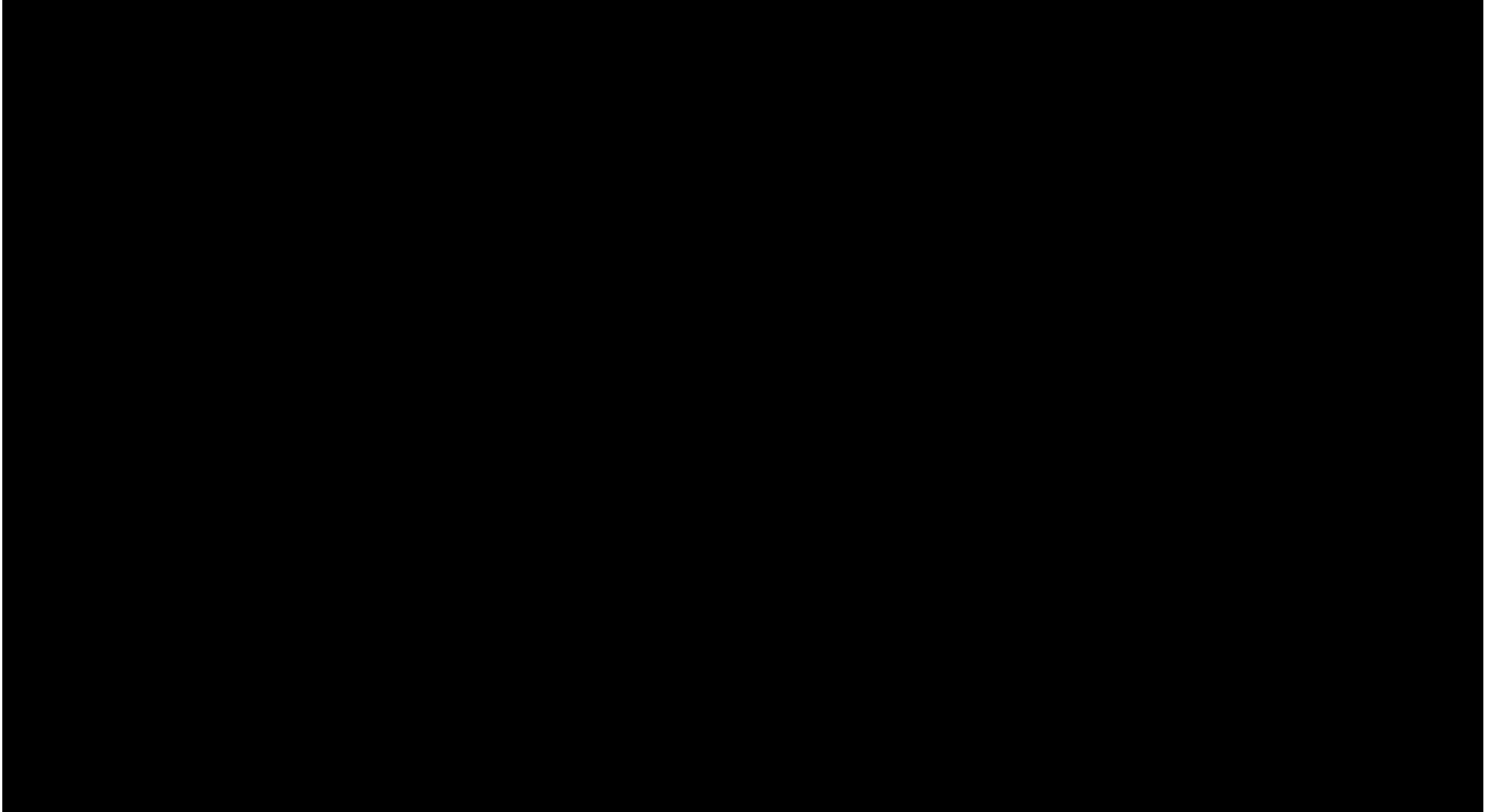


Corporate Information & Communications Technology Benchmarks

Sourcing Metrics

- Total annual expenditure on sourcing arrangements as a % of ICT operating expenditure (excluding depreciation)

Total annual expenditure on sourcing arrangements as a % of ICT operating expenditure (excluding depreciation)



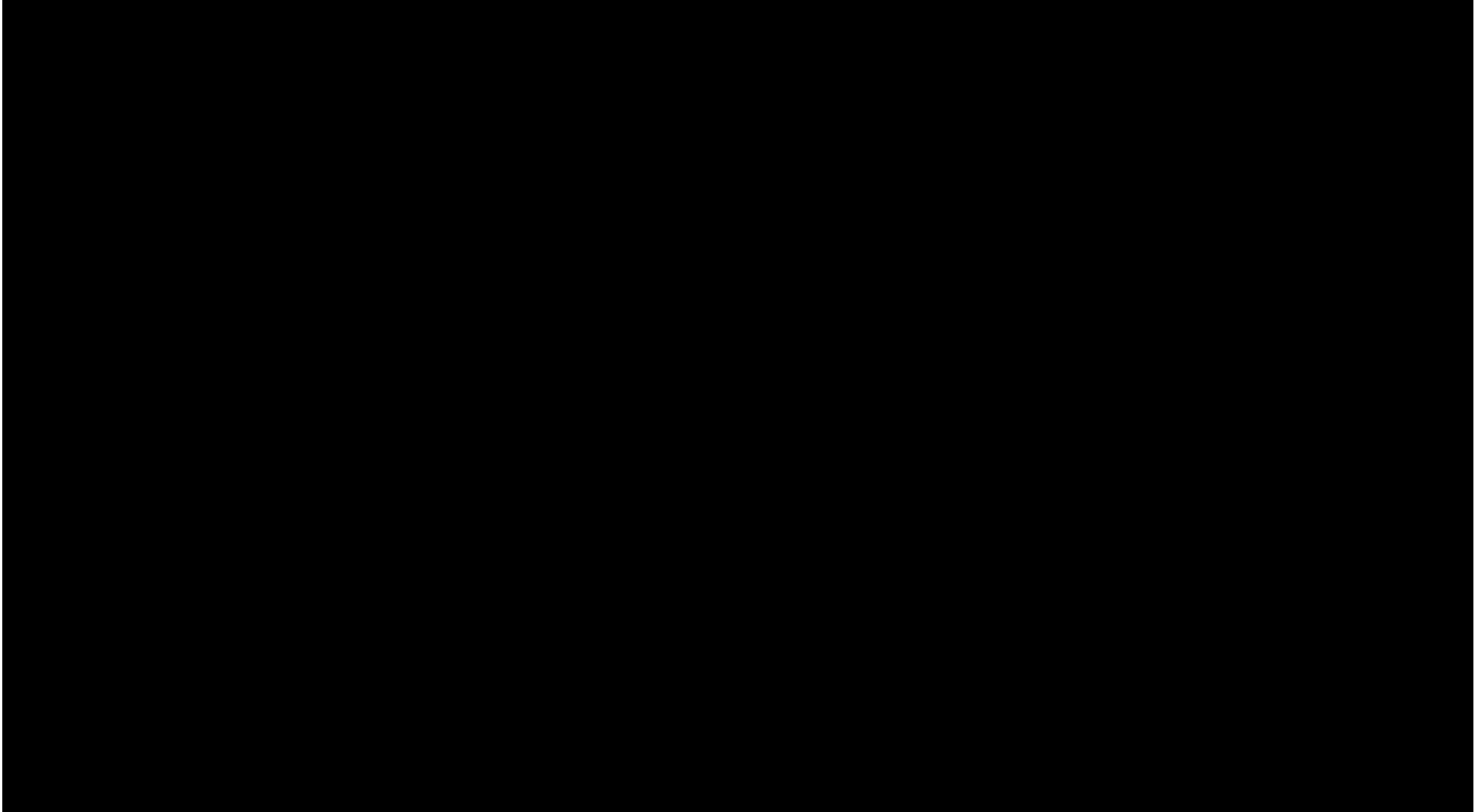


Corporate Information & Communications Technology Benchmarks

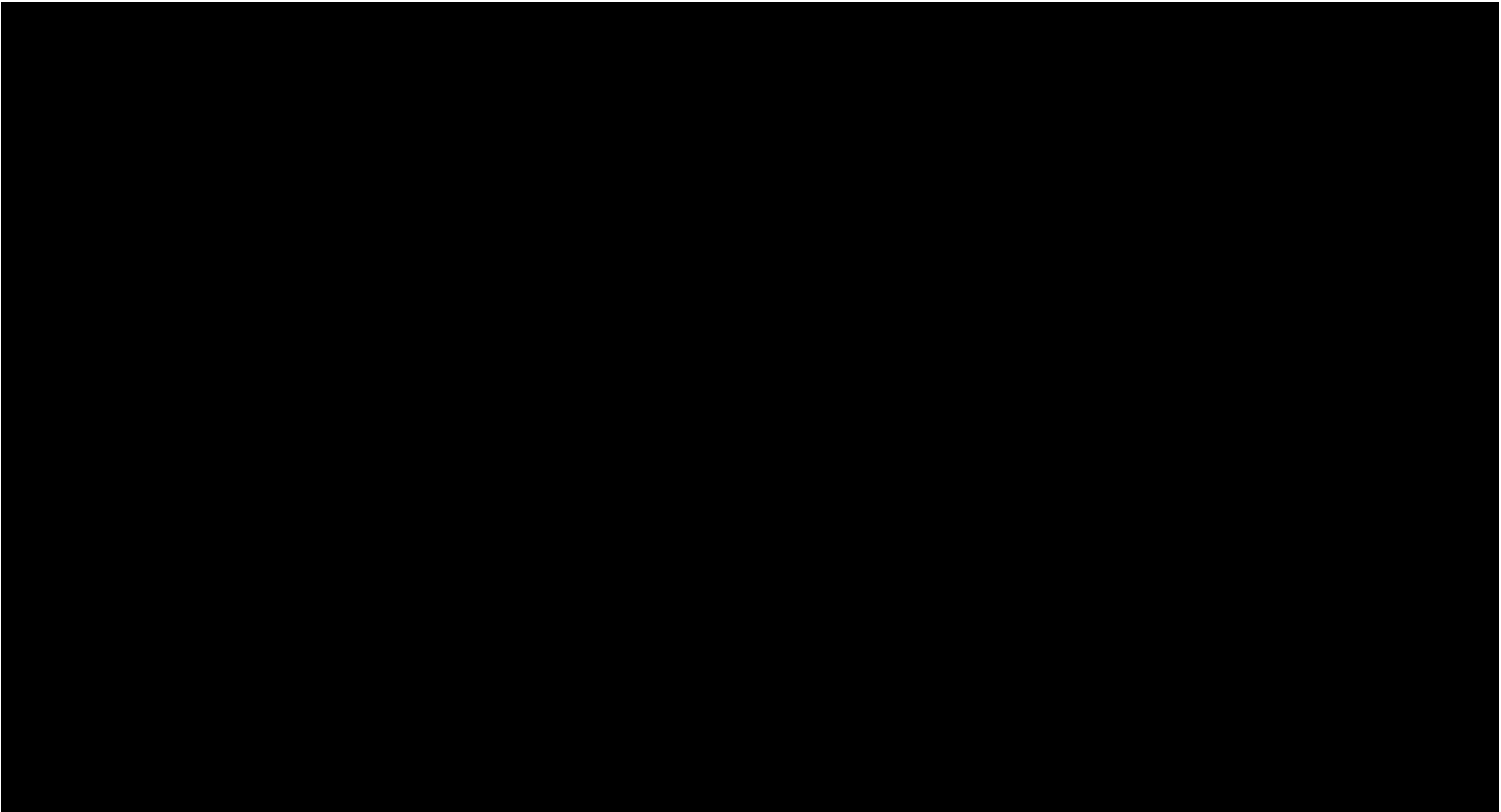
Project Delivery Metrics

- Total project budget as a % of total ICT expenditure (operating and capital),
- Category breakdown of projects, and
- Category breakdown of project delivery methodology.

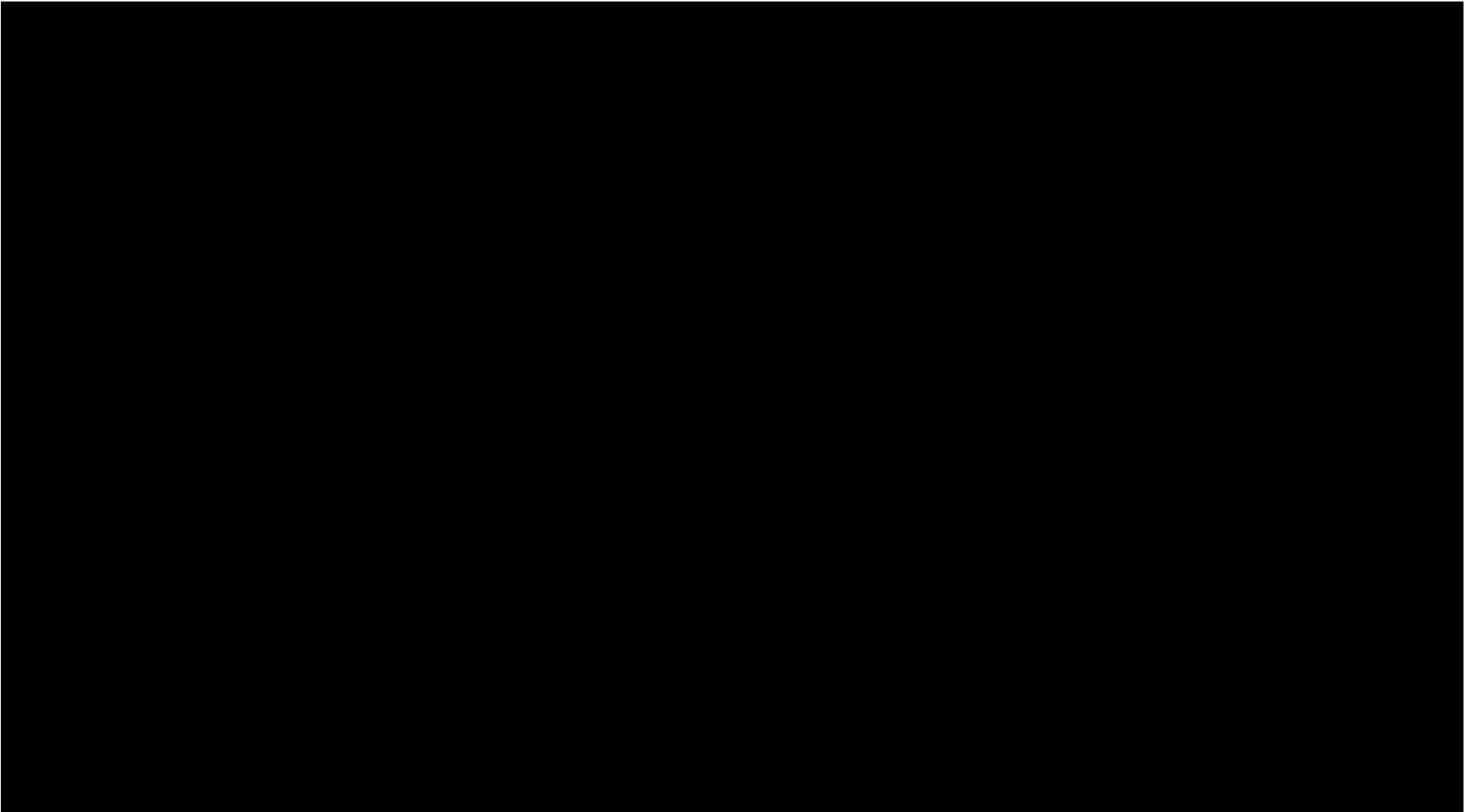
Total project budget as a % of total ICT expenditure (operating and capital)



Category breakdown of projects



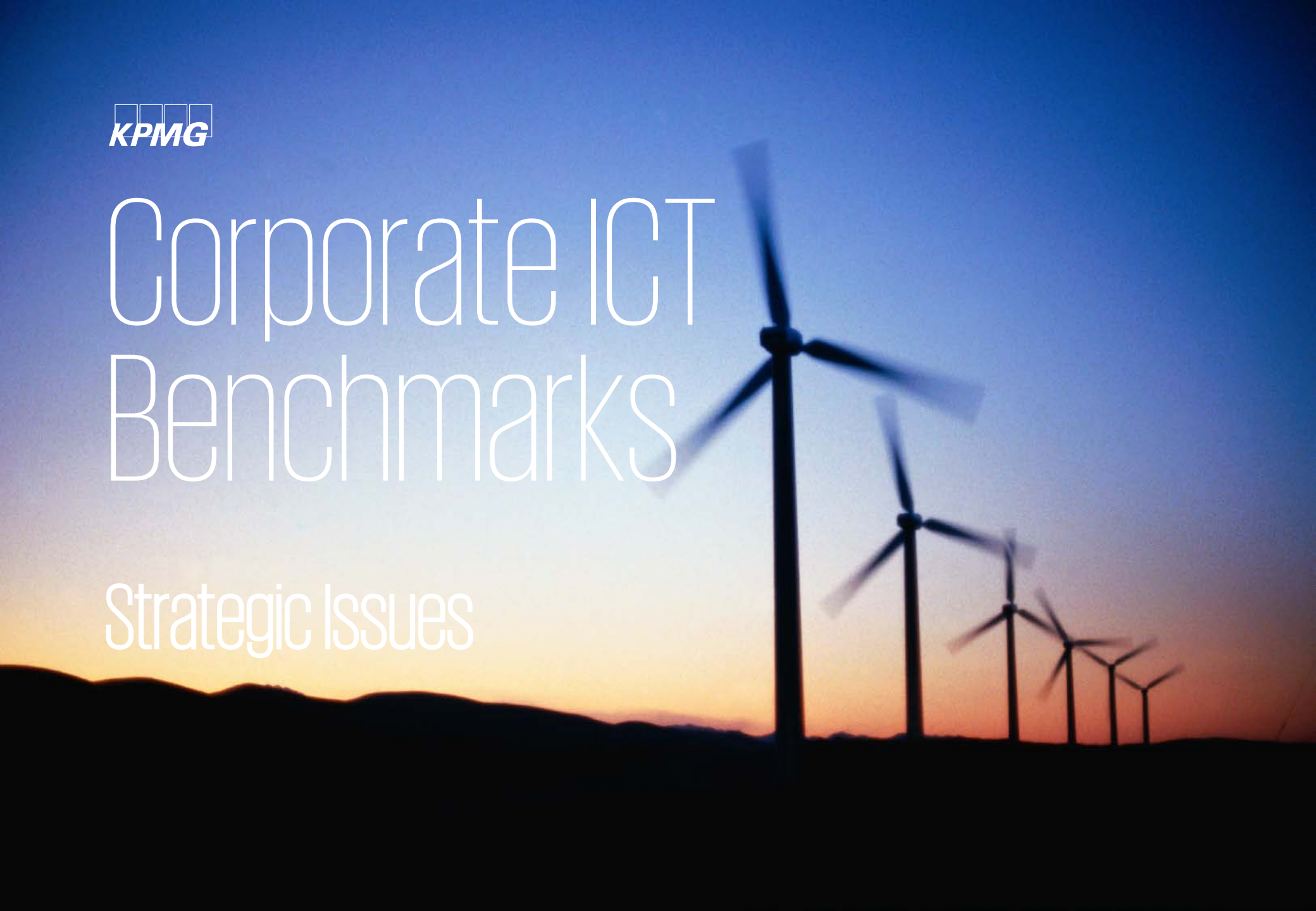
Category breakdown of project delivery methodology





Corporate ICT Benchmarks

Strategic Issues





Corporate Information & Communications Technology Benchmarks

Strategic Issues

- Top five CIO challenges,
- Technologies – status and planned investment – breakdown by technology category,
- Cloud Services – status and planned investment – breakdown by technology category,
- Innovation/smart strategies – status and planned investment – breakdown by innovation/smart strategies,
- Business Strategies – status and planned investment – breakdown by business strategies,
- Technology convergence of ICT and OT – status and planned investment – breakdown by operational technologies, and
- Technology convergence of ICT and Metering technologies – status and planned investment – breakdown by Metering technologies.

Corporate ICT – Strategic Issues

Top CIO challenges



Notes: Metric is based on the Top 5 CIO Issues/Challenges provided in the 'Volume & Quality' section of the survey. Challenges selected by 2 or more participants are shown above.

Top five CIO challenges

Project Delivery

- Manage blended delivery, and
- Increasing velocity in project execution.

IT Strategy, Transformation and Regulatory Management

- Aligning with the business and their priorities, growth and efficiency agendas,
- Providing clear leadership and direction with respect to Technology roadmaps and investment priorities,
- Supporting Transformation, and
- Efficiency improvement.

Cost Reduction

- Reduce spend / headcount,
- Cost Control, and
- Cost Optimisation.

Business Intelligence/Data Management/Analytics

- Improved Analytics,
- Analytics, and
- Big data and analytics to enable risk based and predictive asset management.

IT Sourcing

- Sourcing.

ICT Security

- Cyber security,
- Cyber Security - remaining secure and up to date,
- Improved Cybersecurity, and
- ICT Security.

Business and Technology Optimisation

- Consolidation and right sizing of systems,
- Shadow IT - supporting business ownership of applications but retaining IT leadership and ownership of technology decisions,
- Application Rationalisation,
- Field force enablement (schedule and dispatch),
- Mobility, and
- Cumbersome ERP.

ICT Operating Model

- Overcoming cultural resistance to collaboration, experimentation and new ways of working,
- Attracting and retaining the skills/capability required to be successful in this digital era,
- Transition to an Agile Operating Model, and
- ICT Agility.

Information Management

- Improved Information Management.

Cloud Strategy & Transformation

- Cloud Strategy and implementation in the regulated framework,
- Cloud, and
- Transition to Cloud inc.capex/opex regulation funding.

IT/OT Convergence

- ICT and OT Convergence - integration between real time systems and corporate systems and the separation of the functions in the business, and
- IT/OT Convergence.

Metering

- Billing System Replacement & Meter Contestability, and
- Metering Competition.

Innovation

- Exploring and exploiting new technology (innovation & digital) in support of the business priorities, and
- Emerging Industry Trends.

Ringfencing and Growth of Unregulated Business

- Ringfencing and Growth of Unregulated Business.

Notes: Metric is based on the Top 5 CIO Issues/Challenges provided in the 'Volume & Quality' section of the survey

Technologies

Technology Area	TransGrid	
	Current Application	Planned Investment
Asset Management	Ellipse	Increase \$0-5m
Project Management/delivery	Microsoft Project Server	Increase \$0-5m
Work/work scheduling	Ellipse/TRAC (bespoke)	Increase \$0-5m
Outage management	THEOS (bespoke)	Increase \$0-5m
Billing/network billing	TUOS (Bespoke)	No Change
Finance management	Ellipse V8	Increase \$0-5m
Reporting	MS SQL Analysis Services	Increase \$0-5m
Human resources management	Ellipse Peoplestreame	No Change
Fieldforce automation	AIM, ATW (Bespoke)	Increase \$0-5m
Data warehouses/Data marts	MS SQL Analysis Services	Increase \$0-5m
CIS/CRM	Salesforce	No Change
Procurement management	Ellipse	Increase \$0-5m
SCADA	ABB NM4	Increase \$5-10m
Power Network Management Systems	ABB NM4	Increase \$5-10m
Demand Management/Load Forecasting	Powerfactory	No Change

Technologies

Technology Area	TransGrid	
	Current Application	Planned Investment
Office productivity	Microsoft Office 2010	Increase \$0-5m
Communications/Web/Mobile	Cisco VOIP, SharePoint 2010,IOS 10	Increase \$0-5m
Video conferencing	Cisco	Increase \$0-5m
Social Networking/Collaboration	Cisco Jabber	No Change
Social Media	Facebook	No Change
Geographical information management	GE Smallworld	Increase \$0-5m
Metering data management	Metering (Bespoke)	No Change

Corporate ICT – Strategic Issues

Technologies

	TransGrid	
Technology Area	Current Application	Planned Investment
Identity management	Active Directory ADFS	No Change
Middleware/backend integration	Axway gateway	No Change
Mobile and wireless communications	Telstra APN, Cisco	No Change
Drawings and records management	Bentley EDMS	Increase \$0-5m
Cloud platforms	AWS, Azure	Increase \$0-5m
Network Data Analytics	Powerfactory	No Change
Cyber/digital security	Various	Increase \$0-5m

Cloud Services

Technology Area	TransGrid	
	Moved to cloud based services	Plans to move to cloud based services over the next 3 years
Office productivity	Not Considering	Evaluating
Communications / Web / Mobile	Not Considering	Not Considering
Video Conferencing	Not Considering	Not Considering
Social Networking	Not Considering	Not Considering
Social Collaboration	Not Considering	Not Considering
Social Media	Already moved to cloud services	Already moved to cloud services
Asset management	Not Considering	Not Considering
Project management / delivery	Not Considering	Not Considering
Work / work scheduling	Not Considering	Not Considering
Outage management	Not Considering	Not Considering
Geographical information management	Not Considering	Not Considering
Metering data management	Not Considering	Not Considering
Billing / network billing	Not Considering	Not Considering
Finance management	Not Considering	Not Considering
Reporting	Not Considering	Not Considering
Human resources management	Already moved to cloud services	Already moved to cloud services
Identity management	Not Considering	Evaluating
Middleware / backend integration	Not Considering	Not Considering

Cloud Services

Technology Area	TransGrid	
	Moved to cloud based services	Plans to move to cloud based services over the next 3 years
Field force automation	Not Considering	Not Considering
Mobile and wireless communications	Not Considering	Not Considering
Business intelligence / Big data	Not Considering	Not Considering
Data Warehouses / Data Marts	Not Considering	Not Considering
Call centre management / IVR	Not Considering	Not Considering
CIS / CRM	Already moved to cloud services	Already moved to cloud services
Drawings & records management	Not Considering	Not Considering
Knowledge management	Not Considering	Not Considering
Procurement management	Not Considering	Evaluating
Cloud platforms	Already moved to cloud services	Already moved to cloud services
SCADA	Not Considering	Not Considering
Power Network Management Systems	Not Considering	Not Considering
Demand Management	Not Considering	Not Considering
Load Forecasting	Not Considering	Not Considering
Network Data Analytics	Not Considering	Not Considering
Mainframe	Not Considering	Not Considering
Cyber / digital security	Already moved to cloud services	Not Considering

Innovation/smart strategies

Innovation/smart strategies	TransGrid	
	Current Stage	Investment plan over the next three years
Loop or Feeder Automation	Not Considering	No Change
Advanced Metering	Evaluating	Increase \$0-5m
Volt/VAR Control	Evaluating	Increase \$0-5m
Distribution Substation Monitoring	Not Considering	No Change
61850 Substations	Implementing	Increase \$5-10m
Internal Communications Network eg Fibre/WiMax/Wireless Mesh	Implementing	Increase >\$10m
Leverage External Carrier Network eg NBN, 4G, Fixed carriage	Already Using	Increase \$0-5m
Home Area Networks	Not Considering	No Change
Smart Appliances	Not Considering	No Change
Customer Gateways	Not Considering	No Change
Electric Vehicles	Already Using	No Change
Microgeneration / Distributed Generation	Already Using	No Change
Distributed Storage	Implementing	Increase >\$10m

Innovation/smart strategies

Innovation/smart strategies	TransGrid	
	Current Stage	Investment plan over the next three years
Stand Alone Power Systems	Not Considering	No Change
Micro-grids	Not Considering	No Change
Consumption Monitoring Appliances	Not Considering	No Change
Network Data Analytics	Already Using	Increase \$0-5m
Utilities Robotics	Not Considering	No Change
Drones	Already Using	Increase \$0-5m
Field Staff Wearables	Evaluating	Increase \$0-5m
Asset Health Systems	Implementing	Increase \$0-5m
Predictive Maintenance	Implementing	Increase \$0-5m
Building Energy Management	Already Using	No Change

Business strategies

	TransGrid	
	Current Stage	Investment plan over the next three years
Business Strategies		
Business Process Improvements and Automation	Implementing	Increase \$0-5m
Cost Optimisation	Implementing	Increase \$0-5m
Outsourcing Services to External Provider	Already completed	Decrease
Moving to Cloud Platforms	Implementing	Increase \$0-5m
Long Term Sustainability Management	Don't Know	No Change
Abatement Strategies (to offset carbon generated by your organisation)	Already completed	Increase \$0-5m
Social Networking	Already completed	No Change
Information and Decision Support	Implementing	Increase \$0-5m
Cyber / digital security	Implementing	Increase \$0-5m
Innovation strategies		

Technology convergence of ICT and OT

Operational Technologies	TransGrid	
	Current IT and OT convergence	Plans to converge IT and OT over the next 3 years
CO (i.e. CIO & CTO)	Evaluating	Implementing
Budget planning	Evaluating	Implementing
Investment governance and processes	Evaluating	Implementing
Cost structures / Cost centres	Evaluating	Implementing
Management teams	Evaluating	Implementing
Design / architecture authorities	Evaluating	Implementing
Technology teams	Evaluating	Implementing
Communication Networks	Evaluating	Implementing
Control Networks	Evaluating	Implementing
Data centre	Evaluating	Implementing
Data analytics	Evaluating	Implementing
Data governance	Evaluating	Implementing
Cyber / digital security	Evaluating	Implementing
Field devices / site equipment	Evaluating	Implementing
Services catalogues	Evaluating	Implementing
Services providers	Evaluating	Implementing
Asset management framework	Evaluating	Implementing

Technology convergence of ICT and Metering technologies

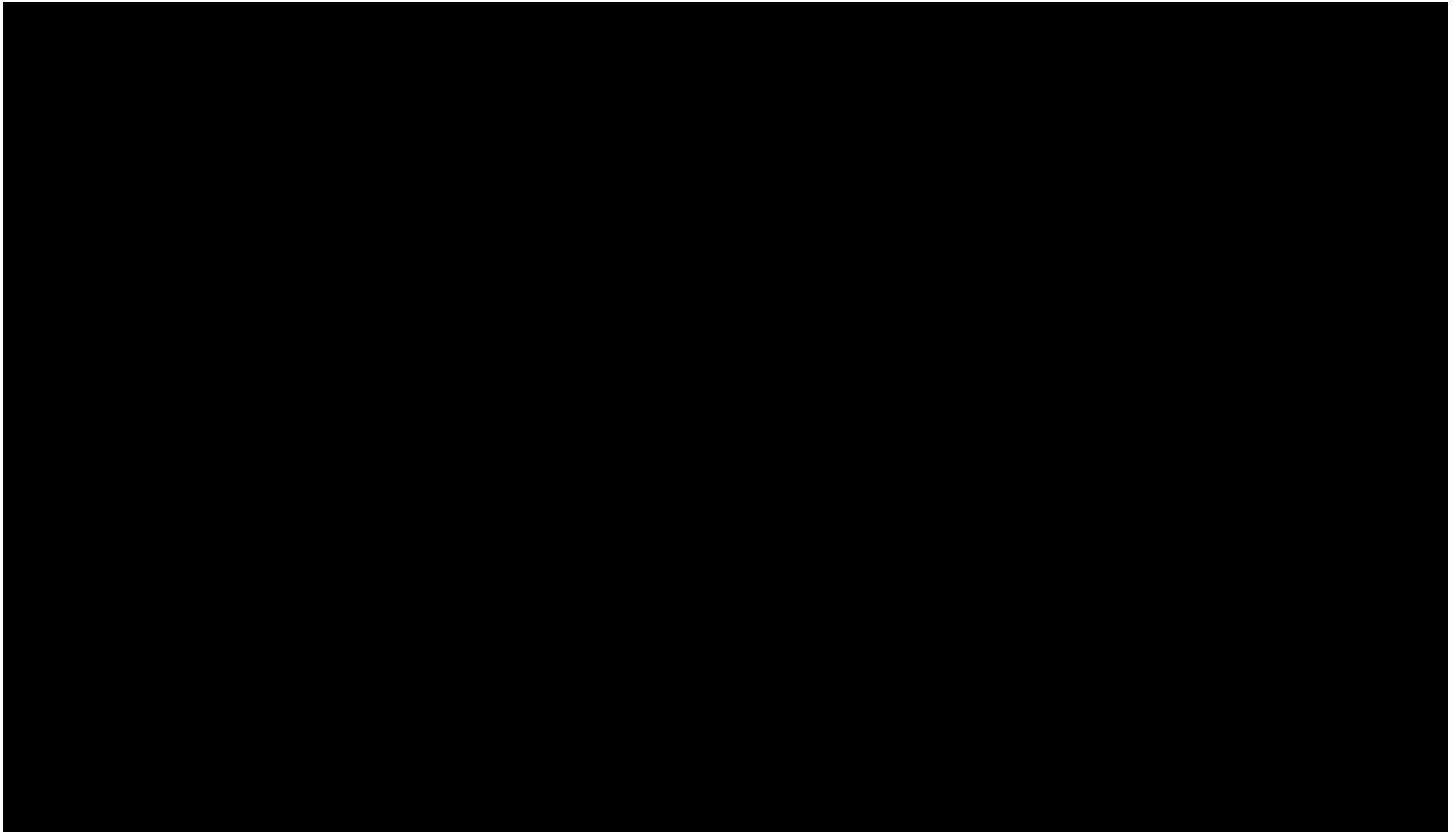
Metering Technologies	TransGrid	
	Current IT and Metering Technologies convergence	Plans to converge IT and Metering Technologies
CO (i.e. CIO & CTO)	Evaluating	Implementing
Budget planning	Evaluating	Implementing
Investment governance and processes	Evaluating	Implementing
Cost structures / Cost centres	Evaluating	Implementing
Management teams	Evaluating	Implementing
Design / architecture authorities	Evaluating	Implementing
Technology teams	Evaluating	Implementing
Communication Networks	Evaluating	Implementing
Control Networks	Evaluating	Implementing
Data centre	Evaluating	Implementing
Data analytics	Evaluating	Implementing
Data governance	Evaluating	Implementing
Cyber / digital security	Evaluating	Implementing
Field devices / site equipment	Evaluating	Implementing
Services catalogues	Evaluating	Implementing
Services providers	Evaluating	Implementing
Asset management framework	Evaluating	Implementing



Regulatory Technology Benchmarks

TNSP Results

Regulatory Technology Benchmarking – use for efficiency comparison





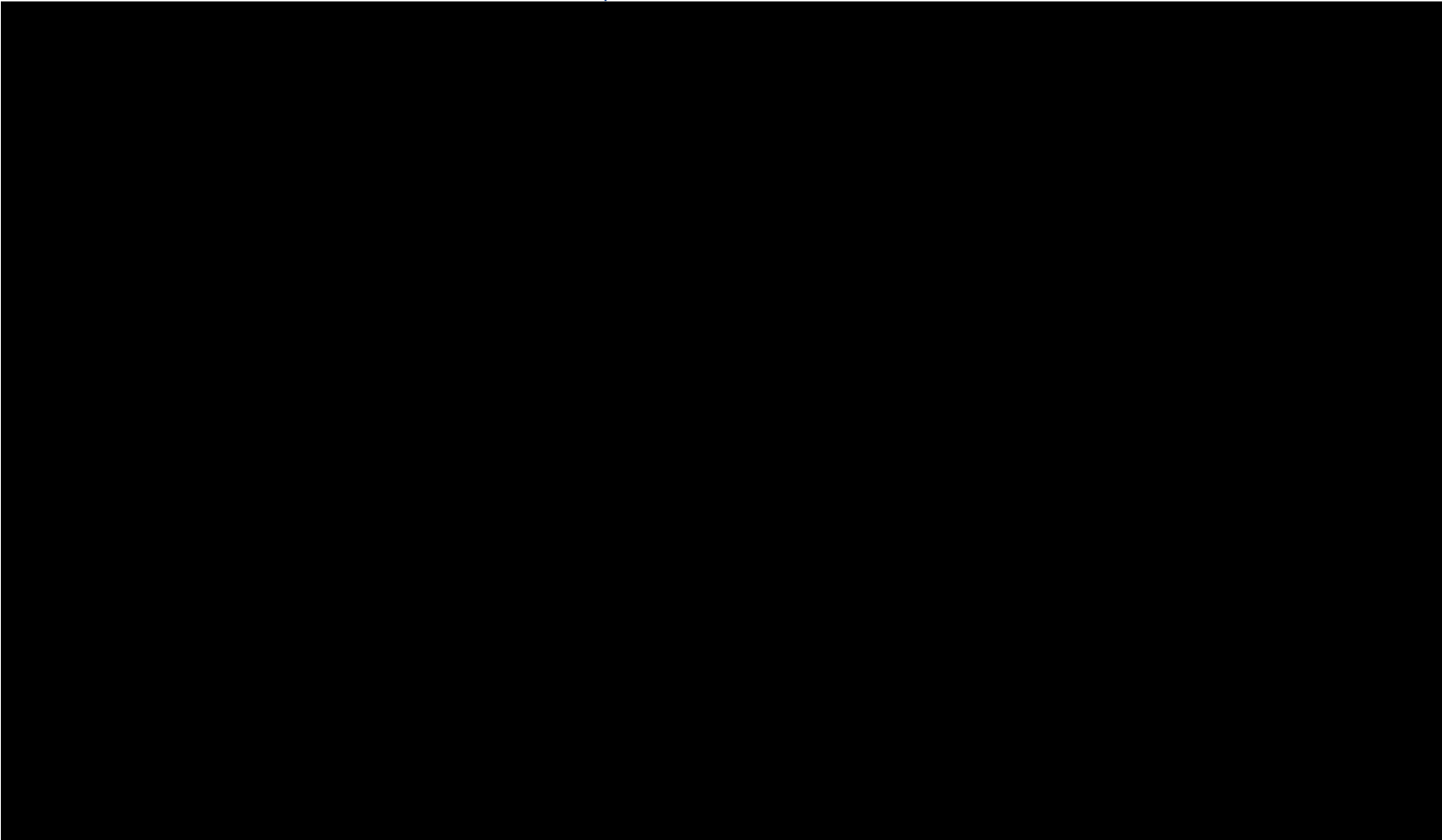
Regulatory Technology Benchmarks

TNSP

Revenue Metrics

- Transmission network revenue per customer.

Transmission network revenue per customer





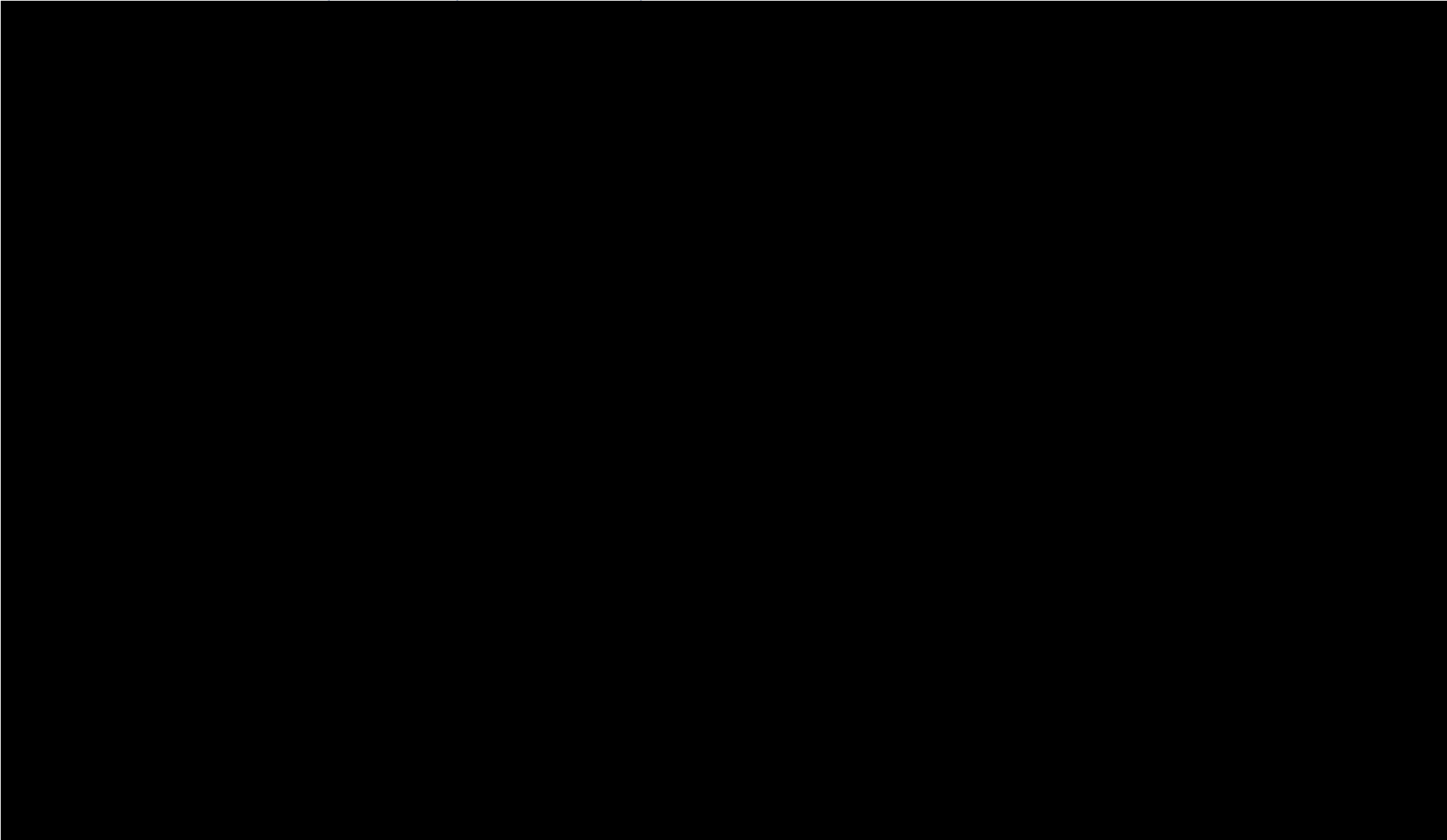
Regulatory Technology Benchmarks

TNSP

Network Expenditure Metrics

- Distribution network capital expenditure per customer,
- Distribution network operating expenditure per customer,
- Distribution network capital expenditure per km circuit length,
- Distribution network operating expenditure per km circuit length,
- Distribution network augmentation capital expenditure as a % of capital expenditure, and
- Distribution network replacement capital expenditure as a % of capital expenditure.

Transmission capital expenditure per customer



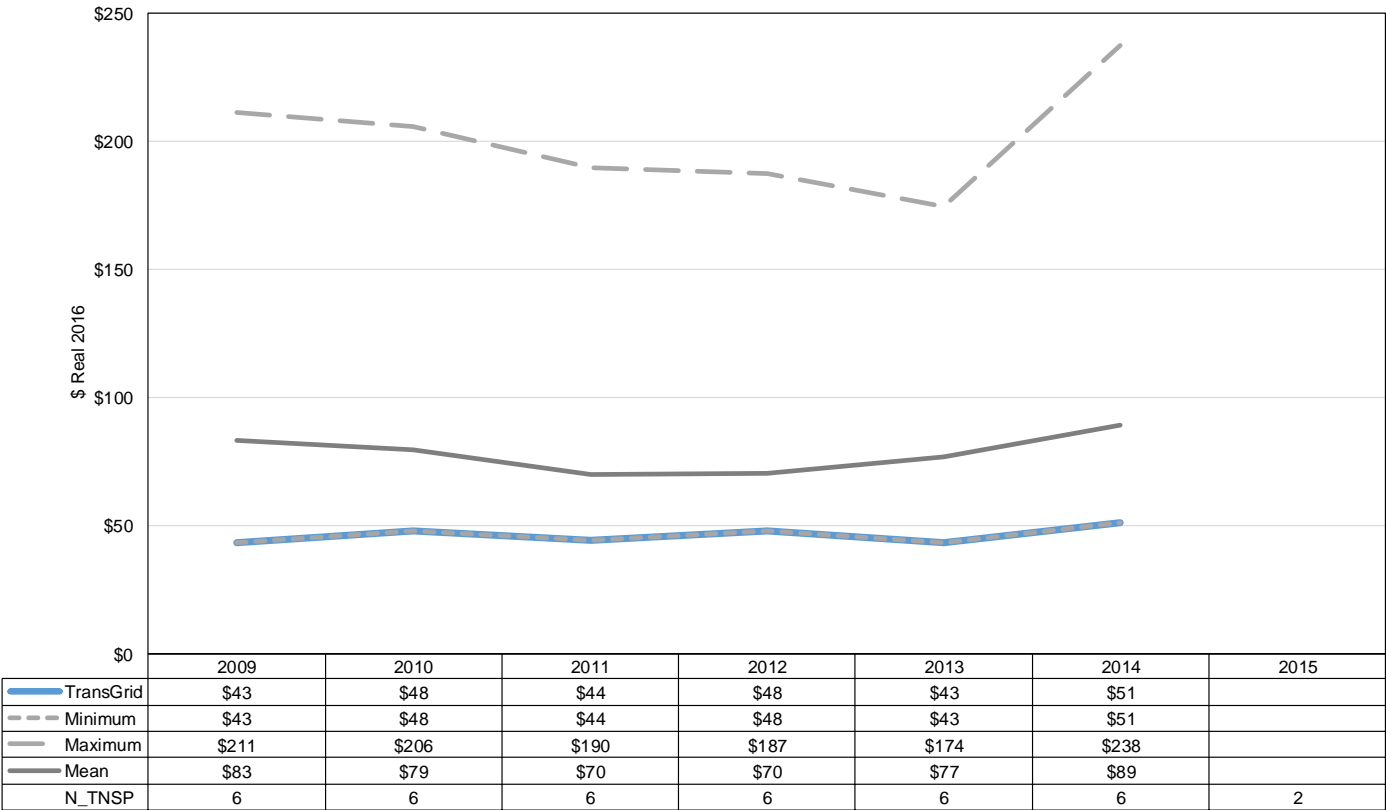
Transmission operating expenditure per Customer

The transmission network businesses have generally increased their operating expenditure per customer from 2009 to 2012, then increased from 2012 to 2014.

The increasing trend of the industry mean is a contrast to the decreasing trend in capital expenditure per customer in recent years.

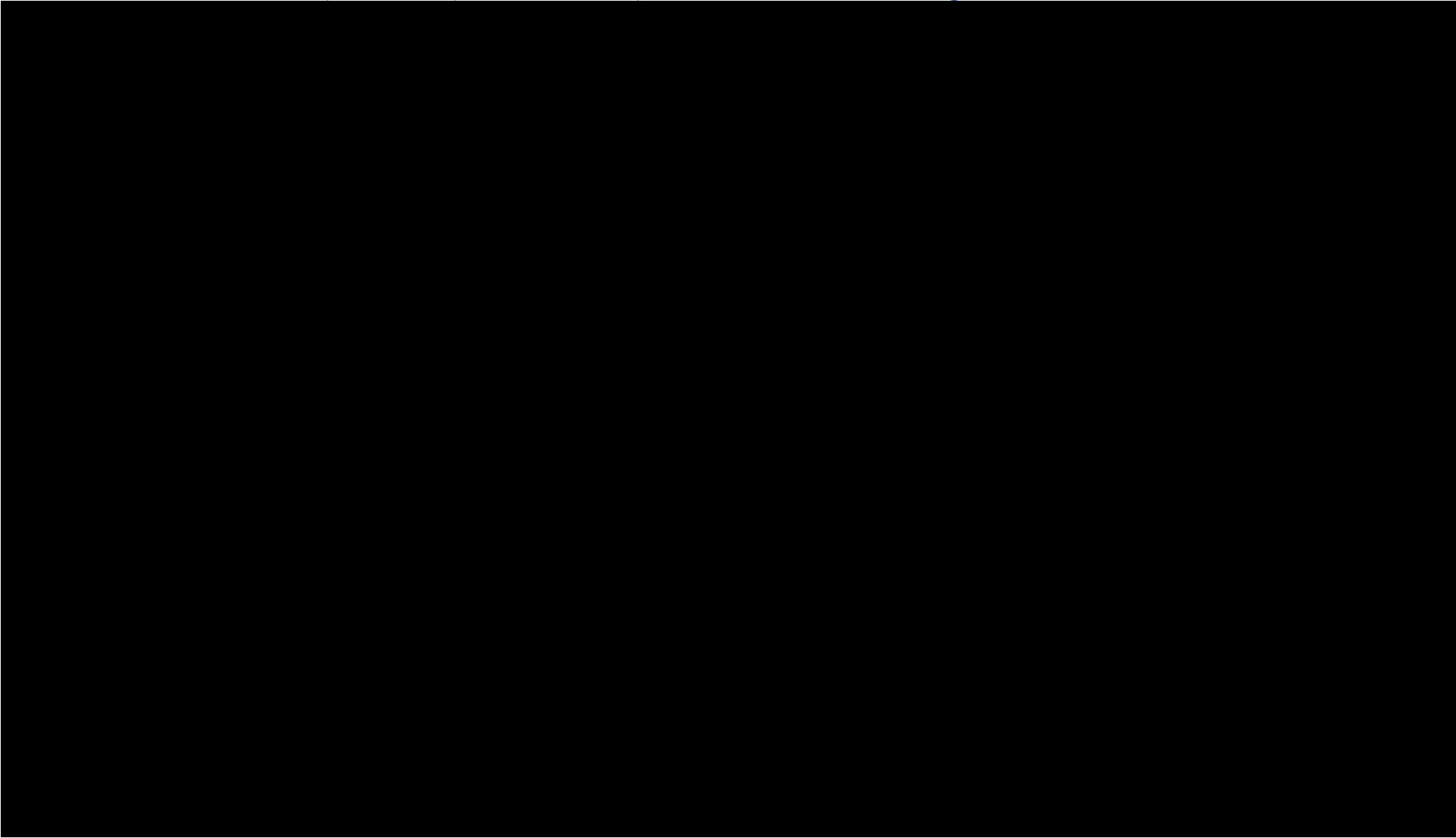
The trend reflects increase in operating activities at the time of capital expenditure constraints across the industry.

TransGrid's results of operating expenditure per customer have been consistently the minimum of the TNSPs from 2009 to 2014.



Note: Metric is calculated by dividing the operating expenditure by the number of customers

Transmission capital expenditure per km circuit length

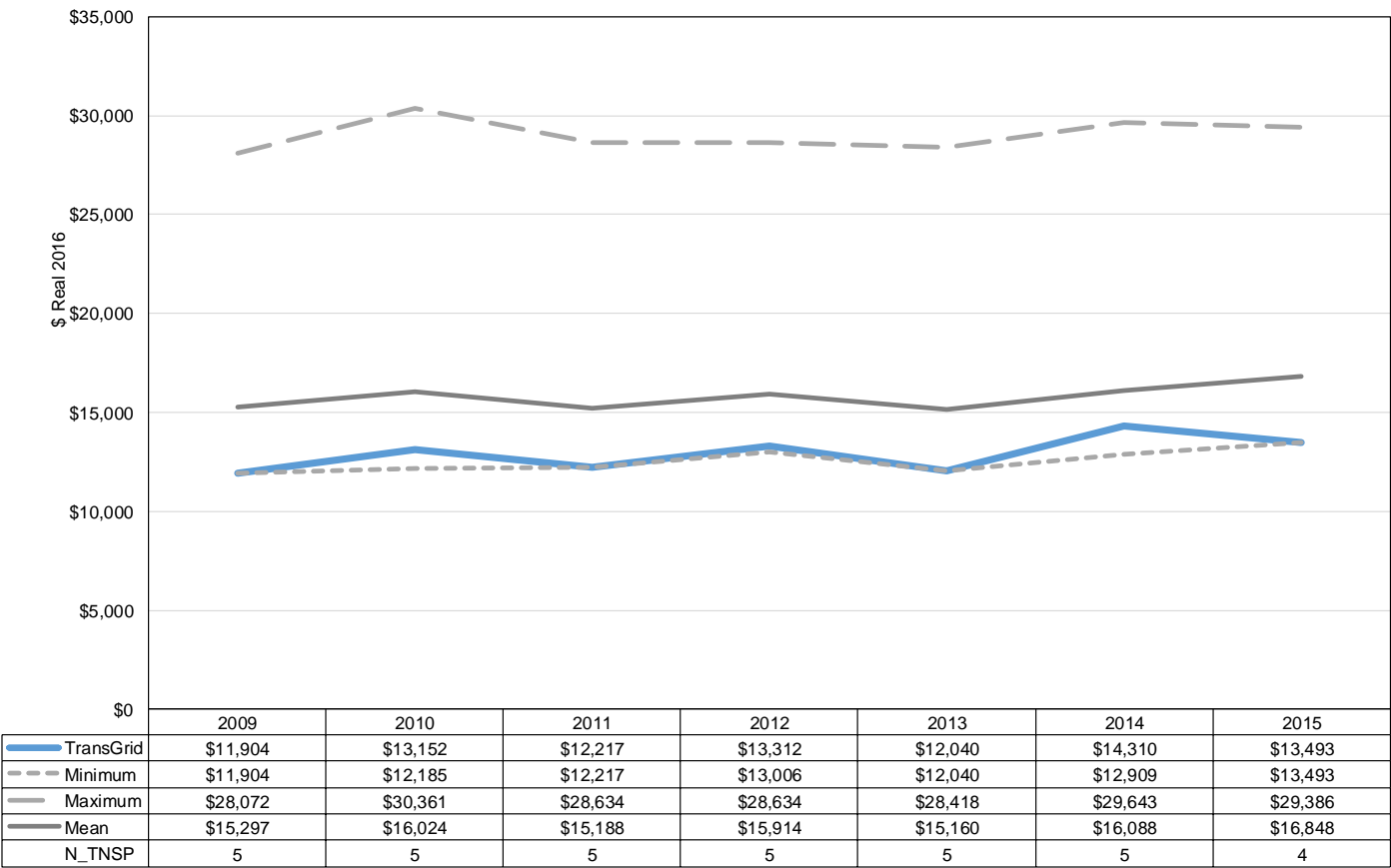


Transmission operating expenditure per km circuit length

Transmission network businesses have generally increased their operating expenditure per km circuit length from 2009 to 2015.

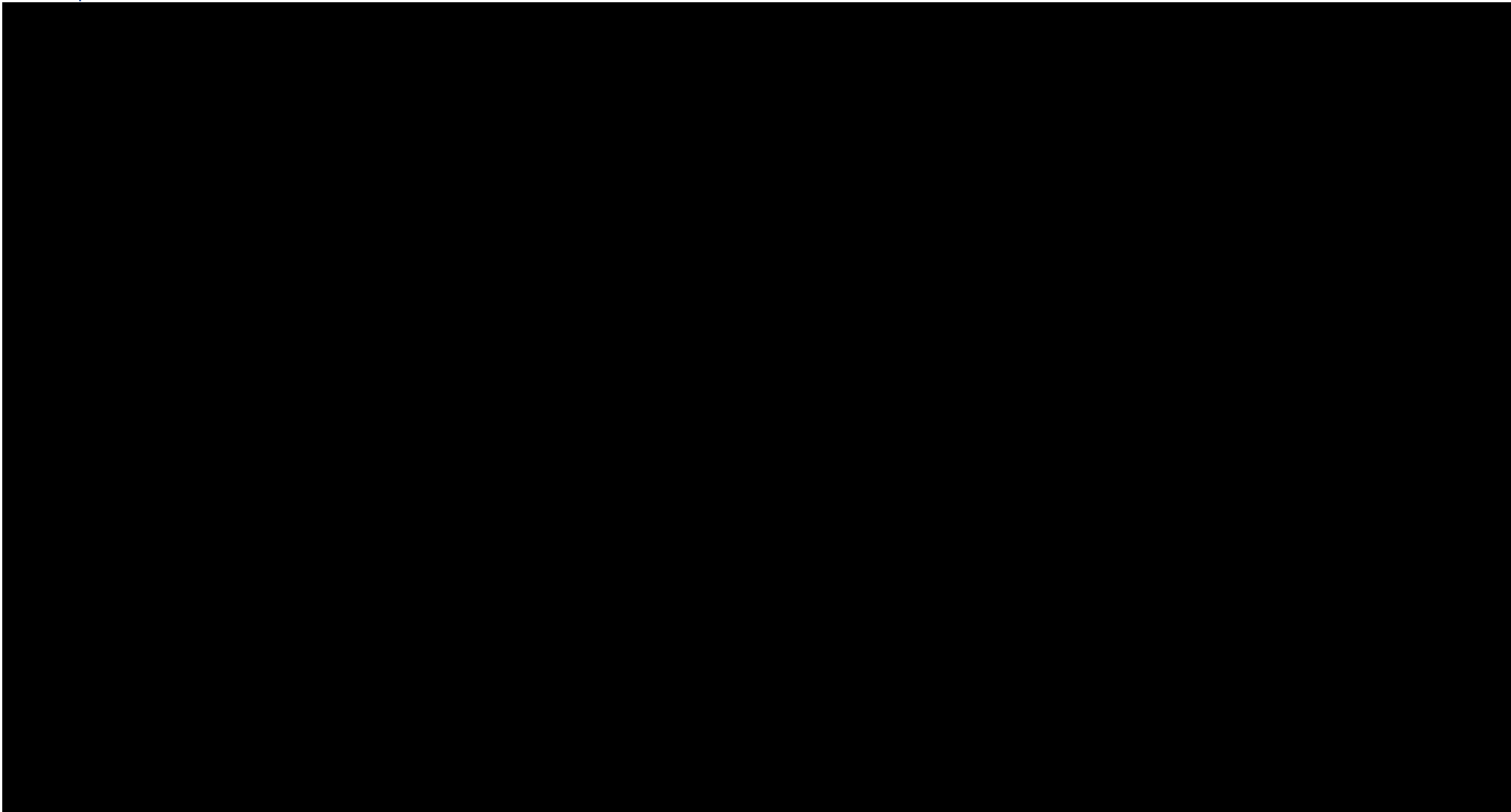
The increasing trend of the industry mean is a contrast to the decreasing trend in the capital expenditure benchmark.

TransGrid's results have been consistently below the industry mean and has reported the industry minimum results for four of the seven years benchmarked.

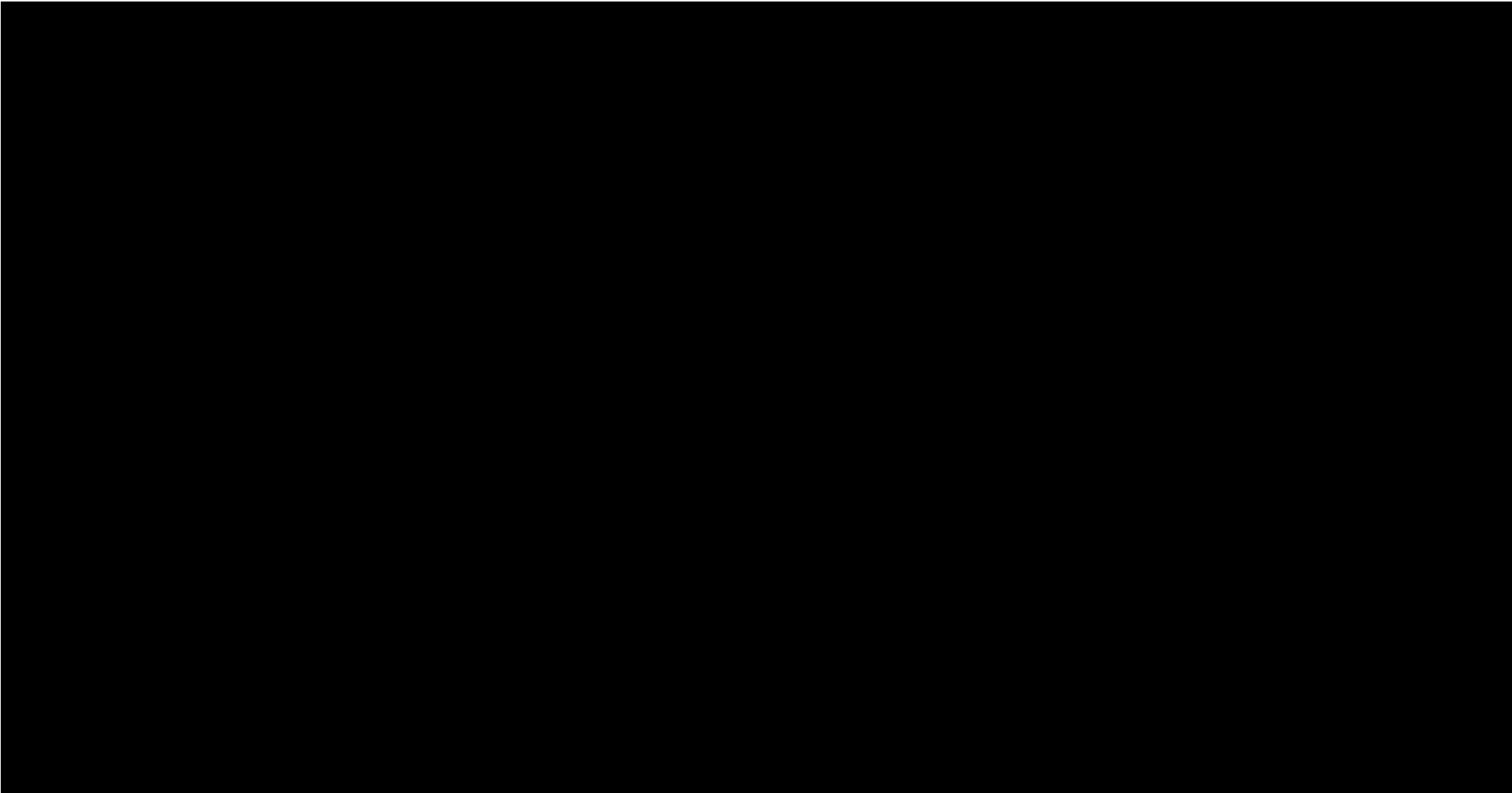


Note: Metric is calculated by dividing the operating expenditure by transmission circuit length

Transmission augmentation capital expenditure as a % of capital expenditure



Transmission replacement capital expenditure as a % of capital expenditure





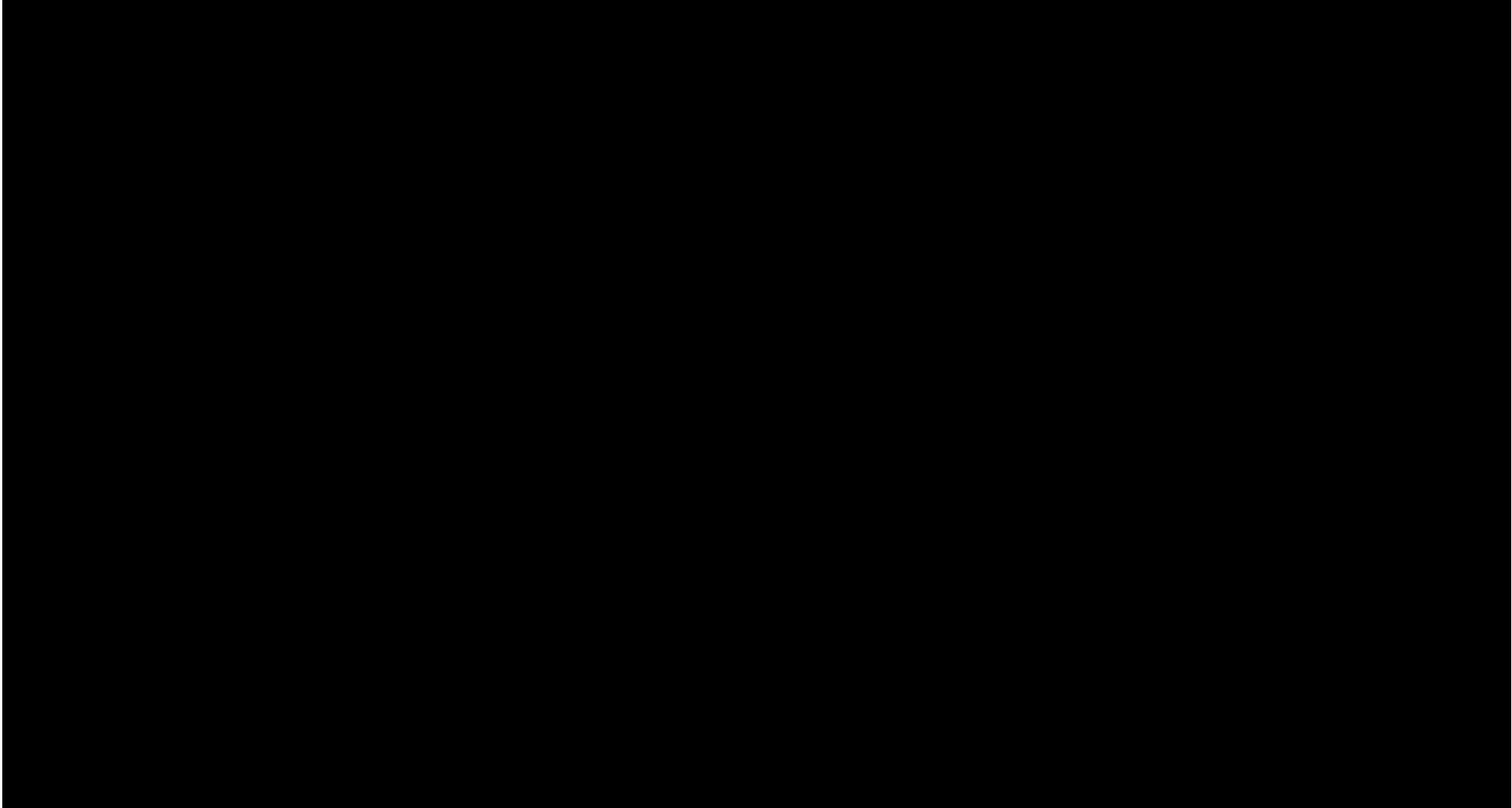
Regulatory Technology Benchmarks

TNSP

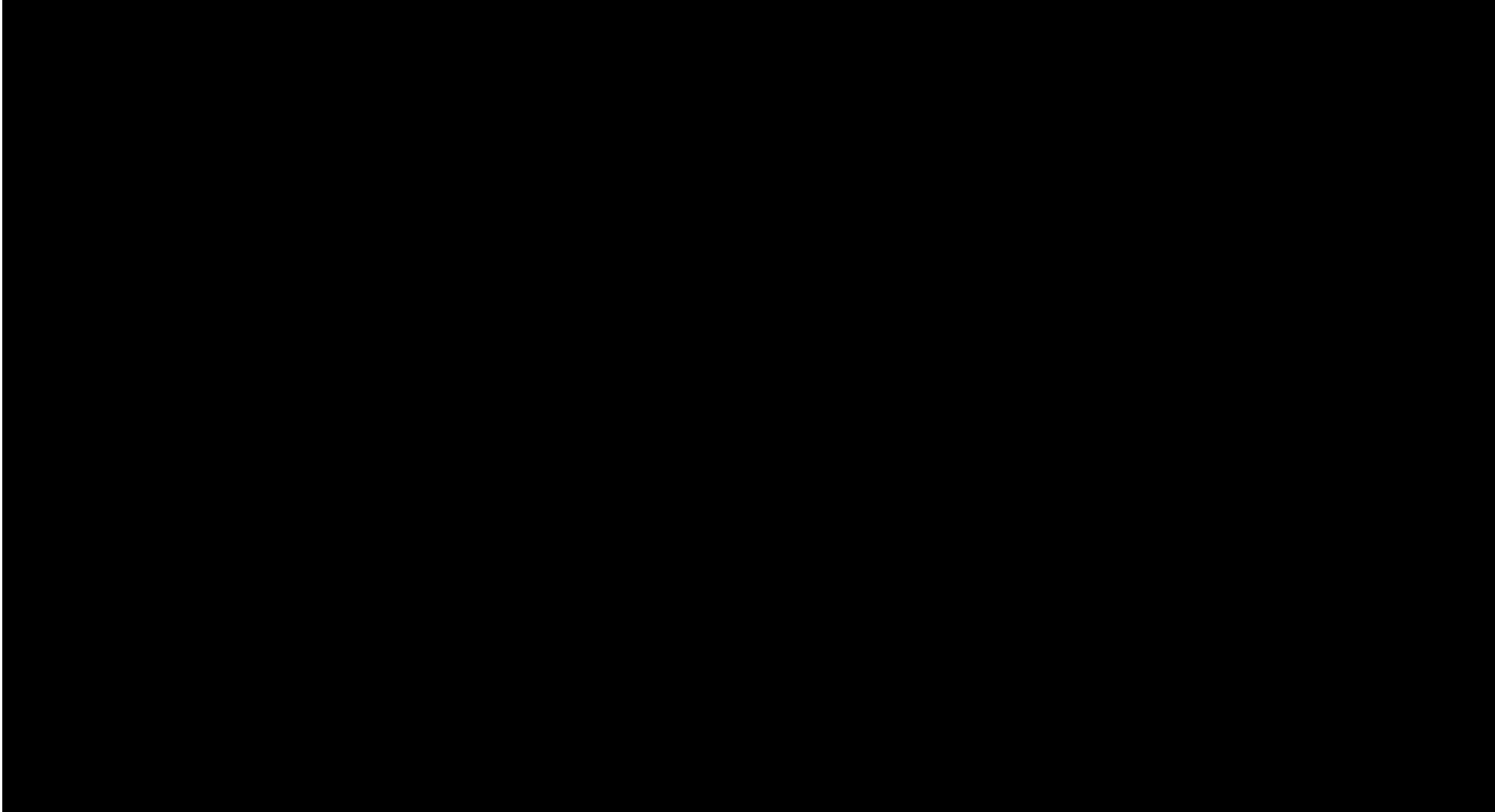
Non-network ICT Capital Expenditure Metrics

- Non-network ICT capital expenditure as a % of capital expenditure,
- Non-network ICT capital expenditure per customer,
- Non-network ICT capital expenditure (non-recurrent) per customer,
- Non-network ICT capital expenditure (client device + recurrent) per customer,
- Non-network ICT capital expenditure (client device + recurrent) per employee,
- Non-network ICT capital expenditure (client device + recurrent) per end user,
- Non-network ICT capital expenditure (client device + recurrent) per device, and
- Non-network ICT capital expenditure (non-recurrent) as a % of non-network IT capital expenditure.

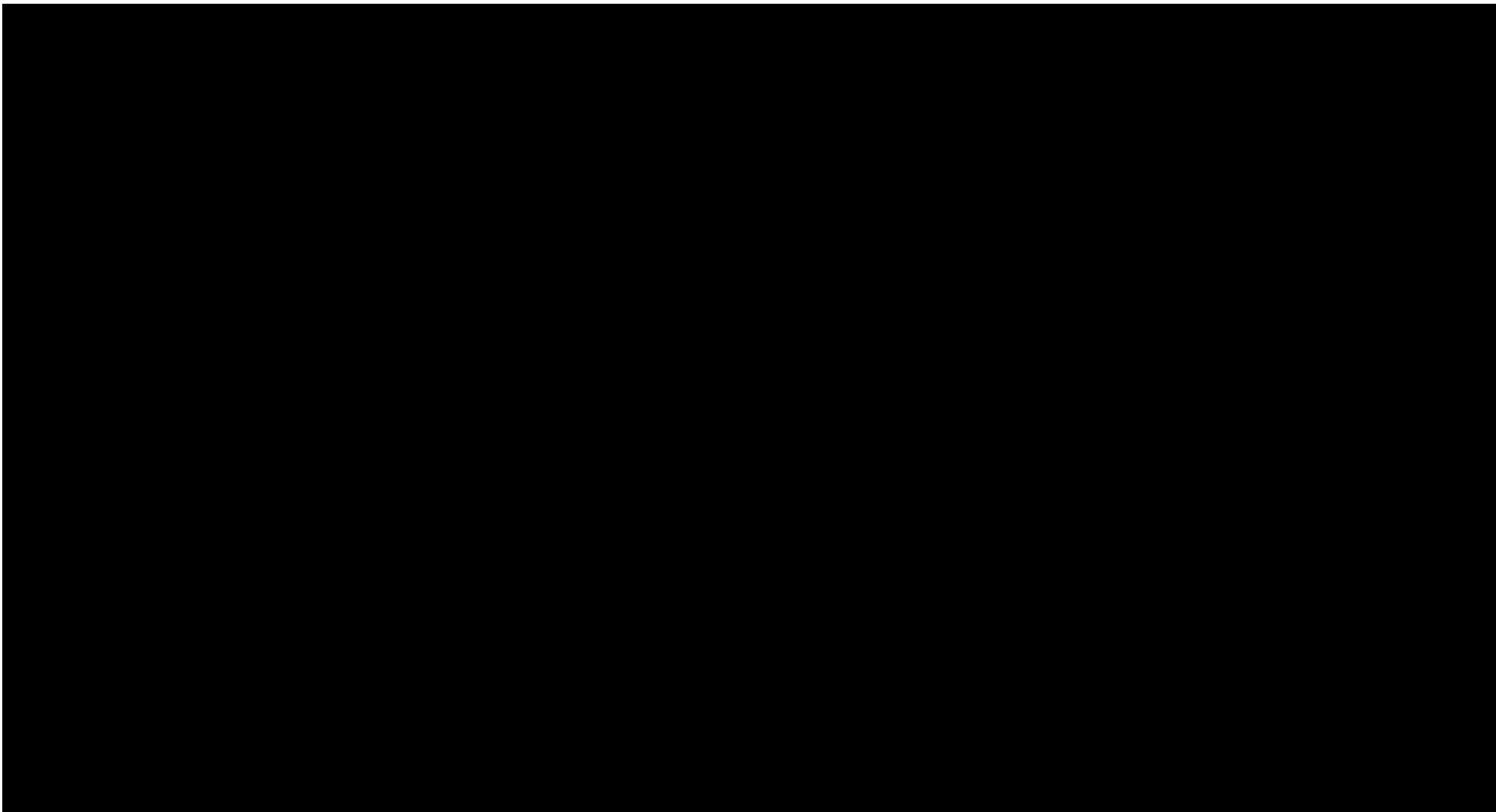
Non-network ICT capital expenditure as a % of capital expenditure



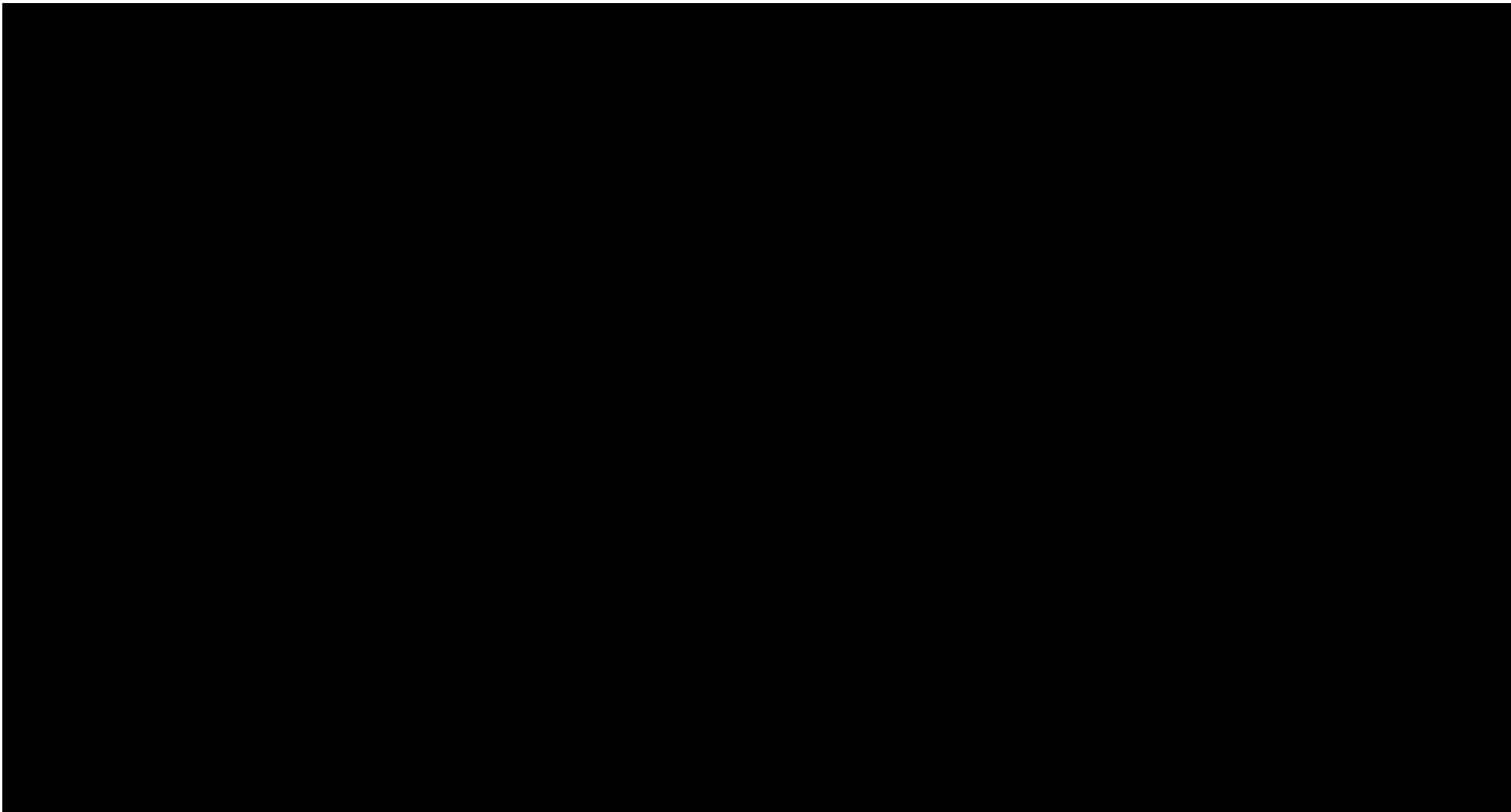
Non-network ICT capital expenditure per customer



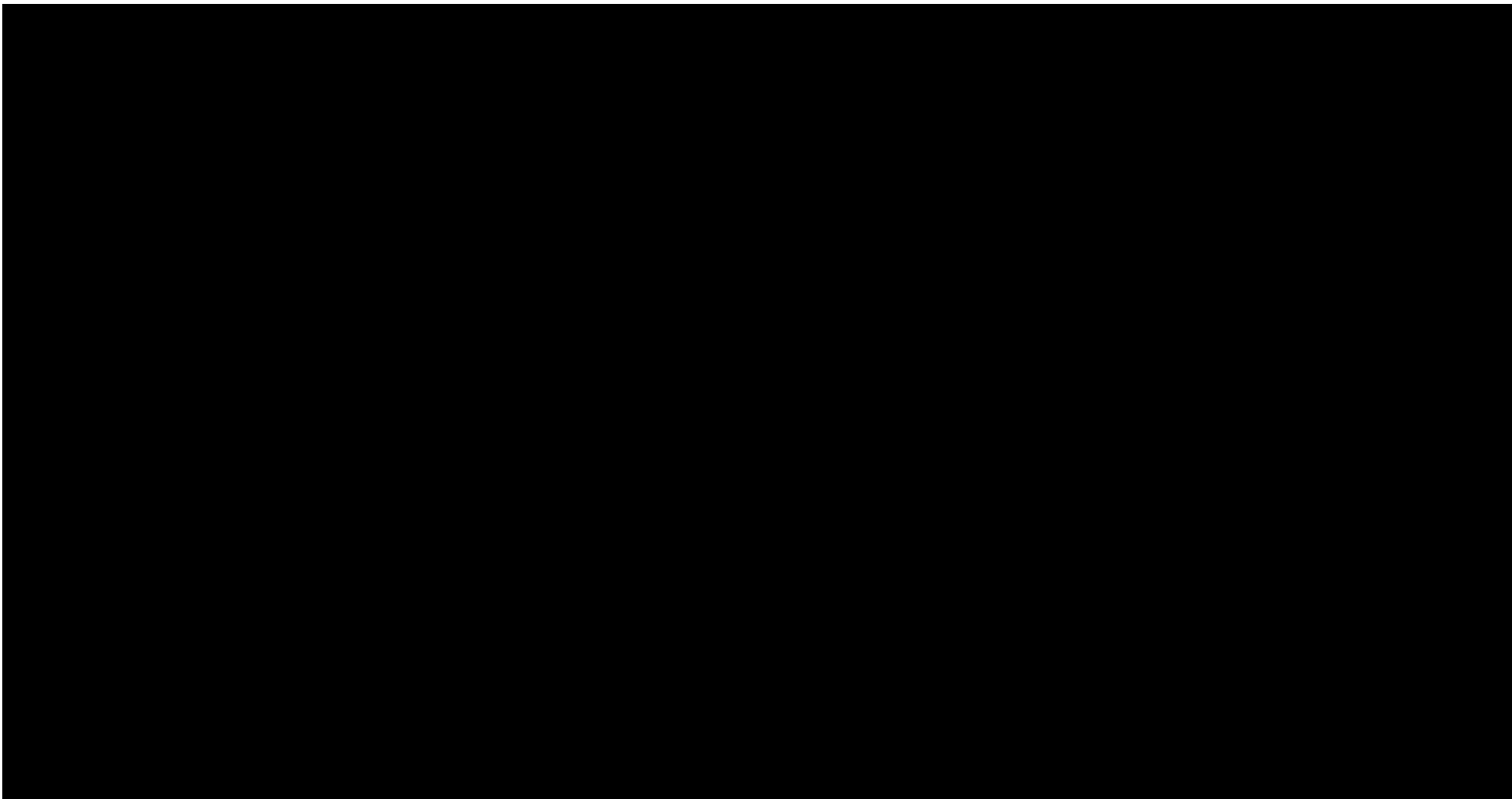
Non-network ICT capital expenditure (non-recurrent) per customer



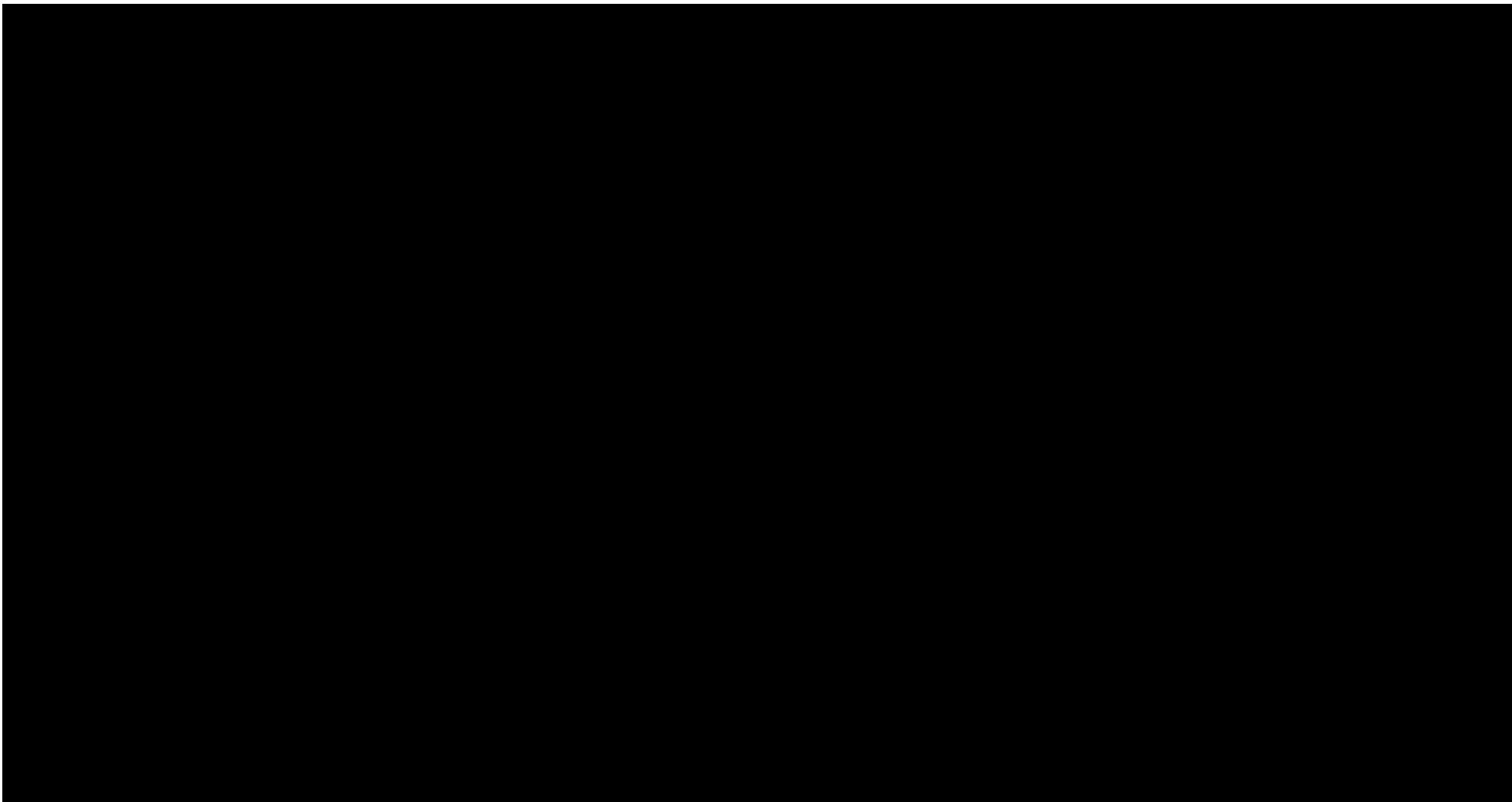
Non-network ICT capital expenditure (client device + recurrent) per customer



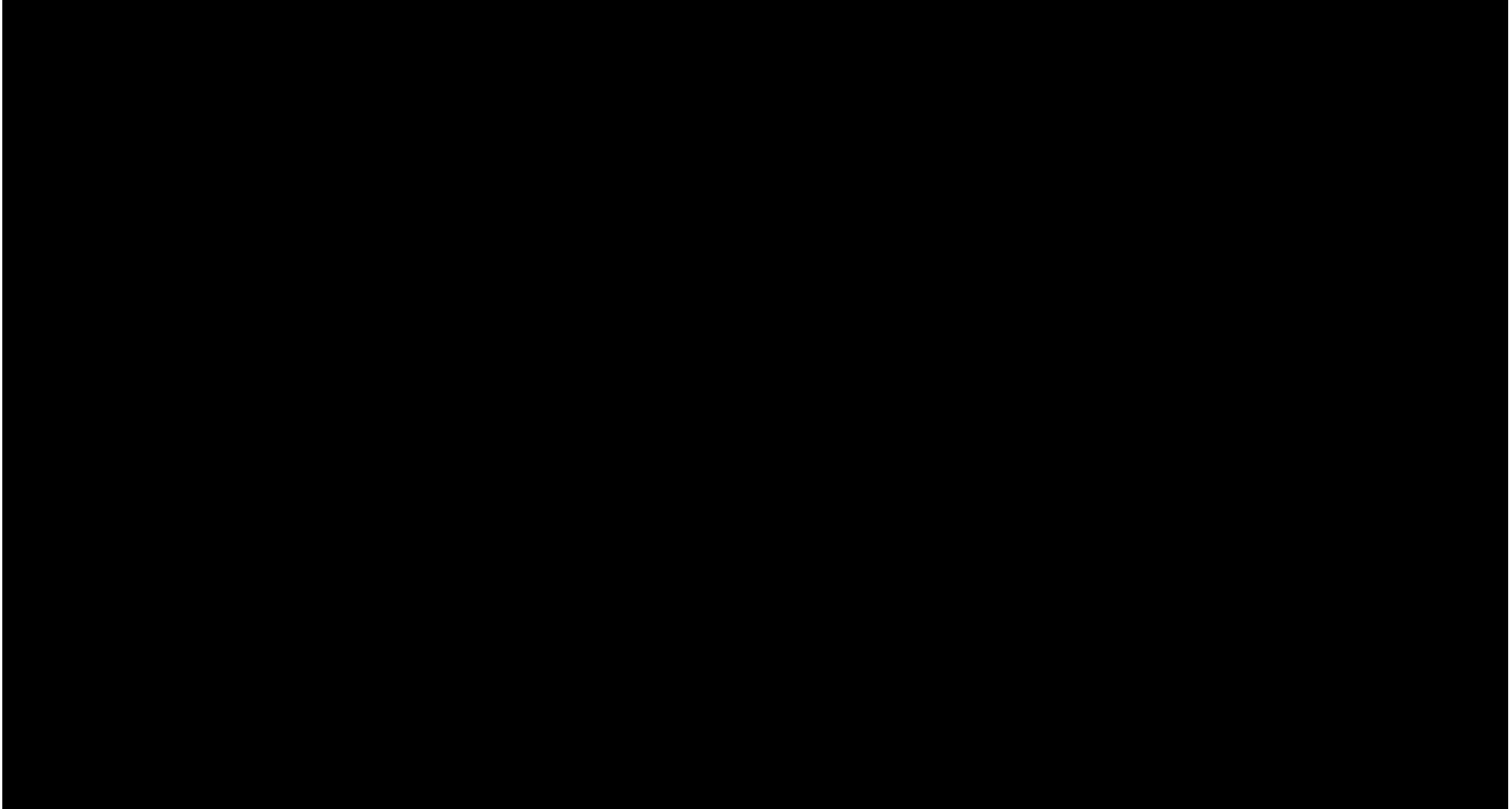
Non-network ICT capital expenditure (client device + recurrent) per employee



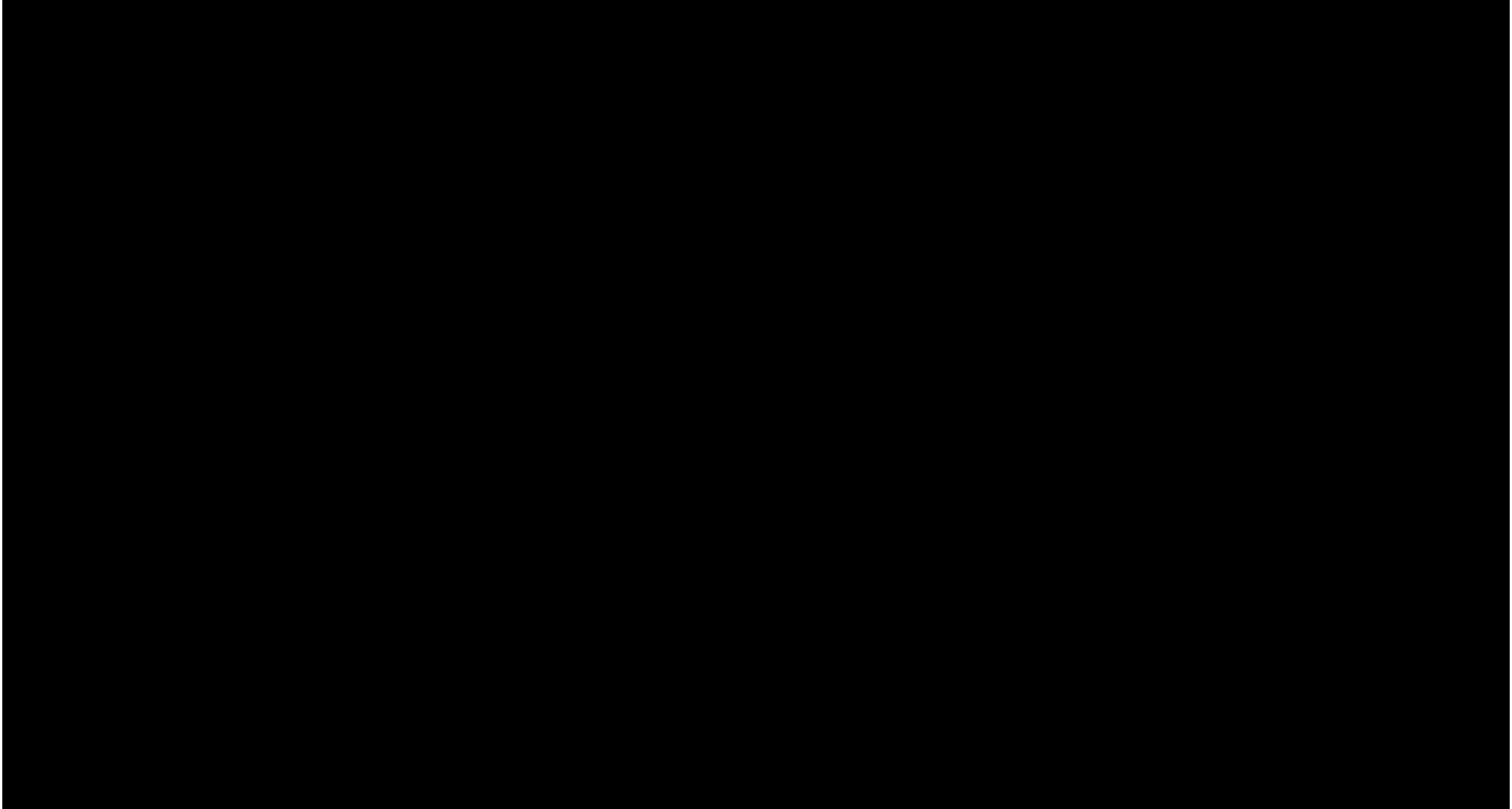
Non-network ICT capital expenditure (client device + recurrent) per end user



Non-network ICT capital expenditure (client device + recurrent) per device



Non-network ICT capital expenditure (non-recurrent) as a % of non-network IT capital expenditure





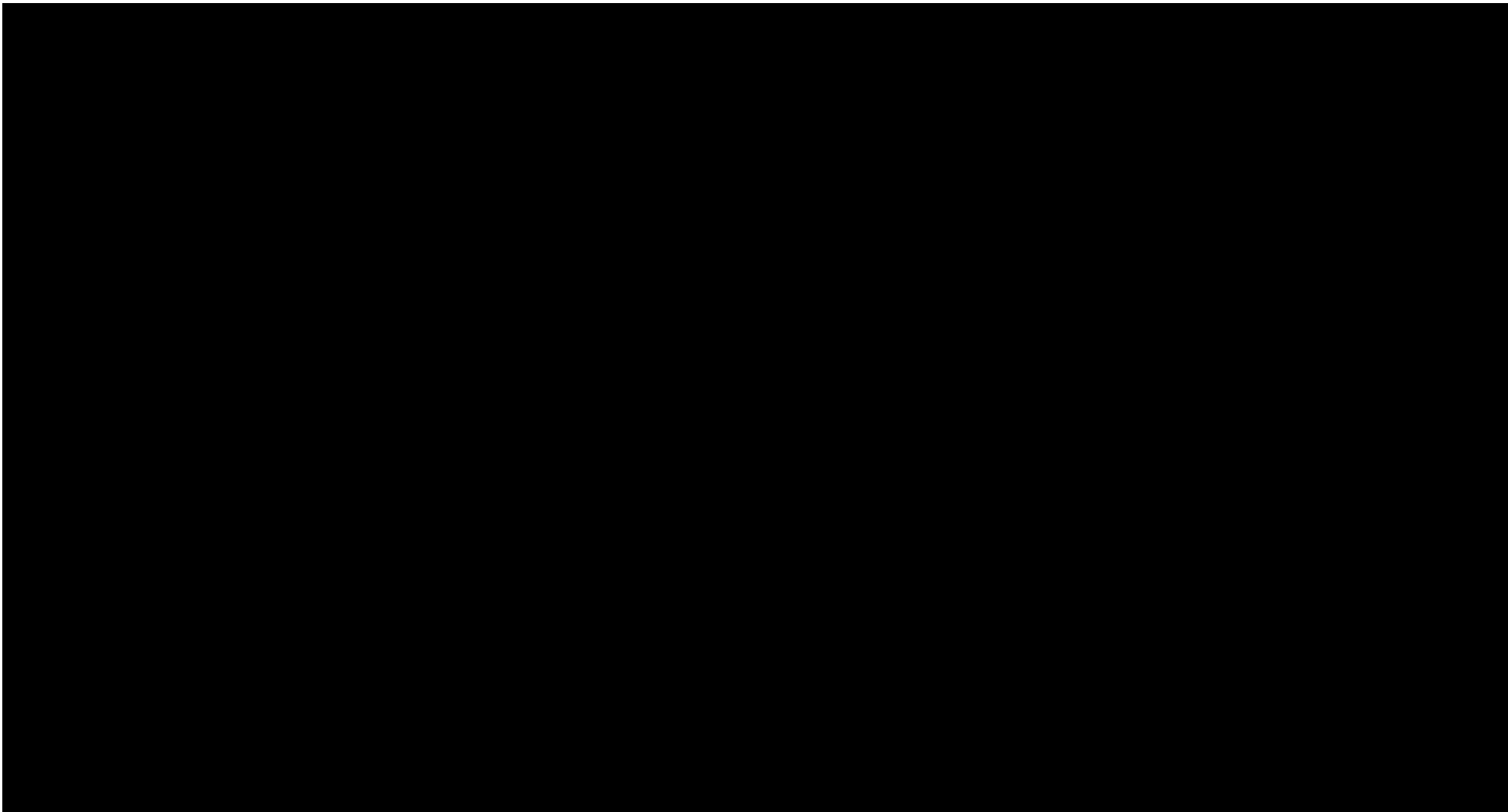
Regulatory Technology Benchmarks

TNSP

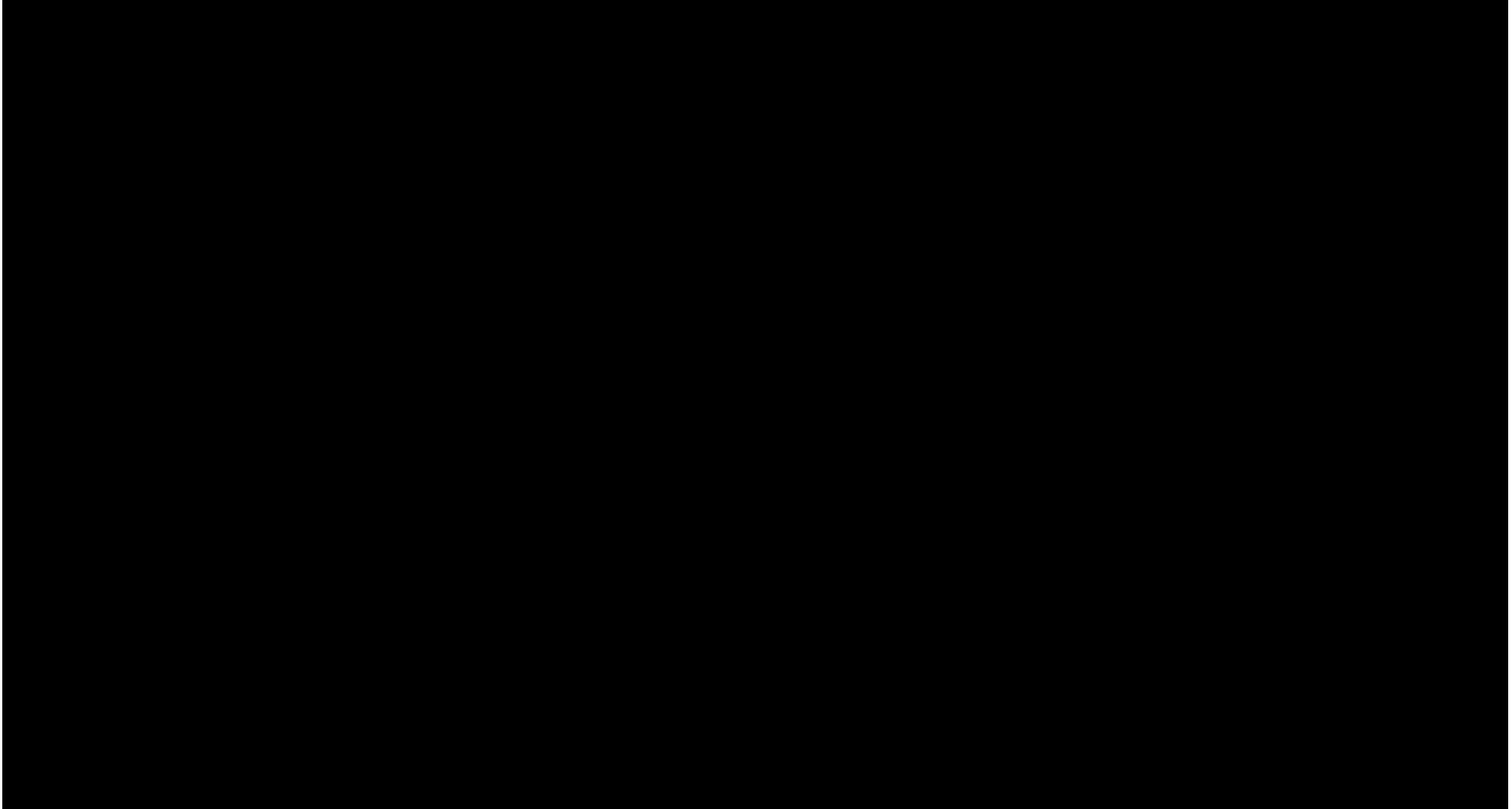
Non-network ICT Operating Expenditure Metrics

- Non-network ICT operating expenditure as a % of operating expenditure,
- Non-network ICT operating expenditure per customer,
- Non-network ICT operating expenditure per employee,
- Non-network ICT operating expenditure per end user,
- Non-network ICT operating expenditure per device,
- Non-network ICT operating expenditure (client device + recurrent) per customer,
- Non-network ICT operating expenditure (client device + recurrent) per employee,
- Non-network ICT operating expenditure (client device + recurrent) per end user, and
- Non-network ICT operating expenditure (client device + recurrent) per device.

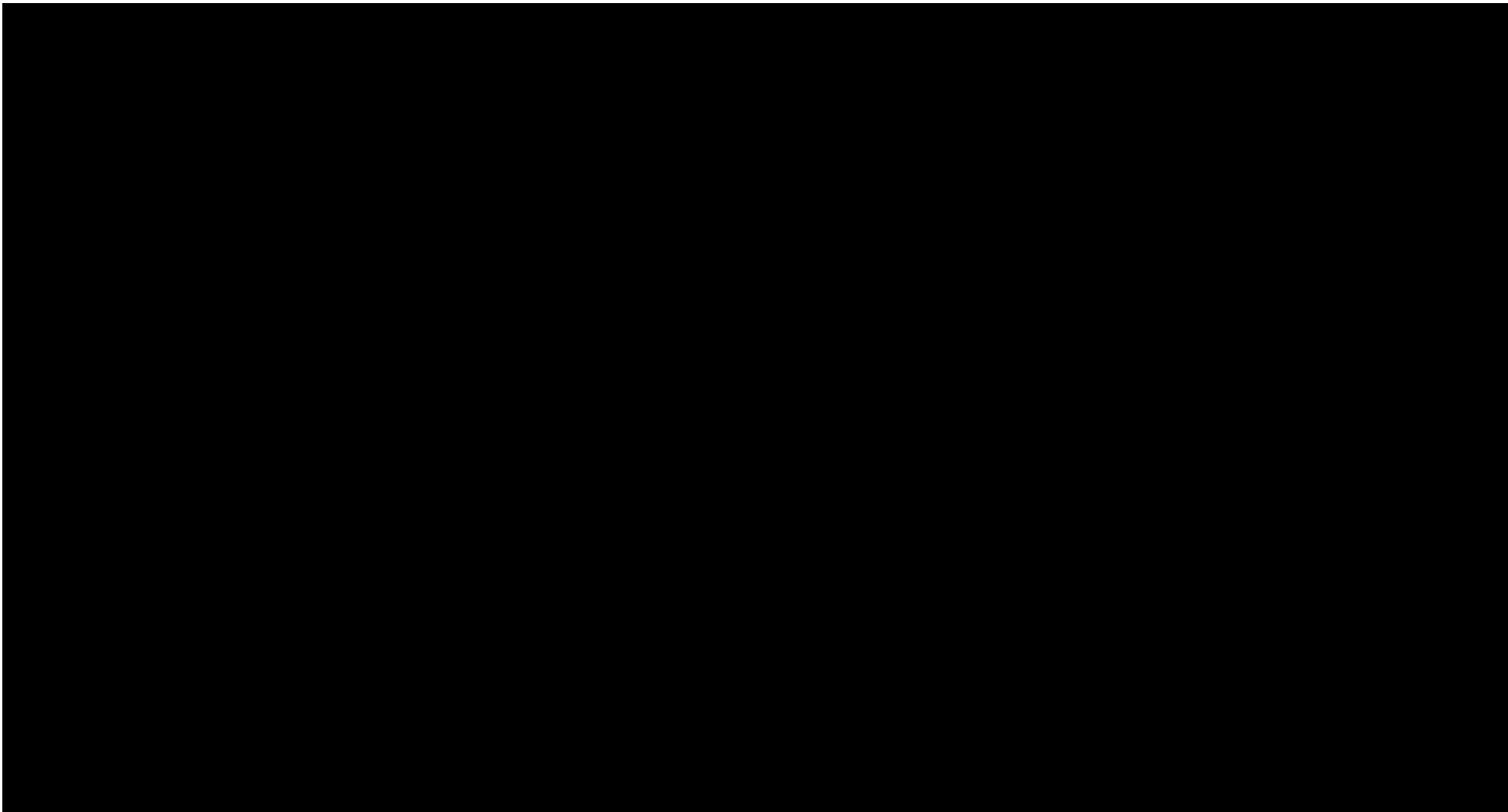
Non-network ICT operating expenditure as a % of operating expenditure



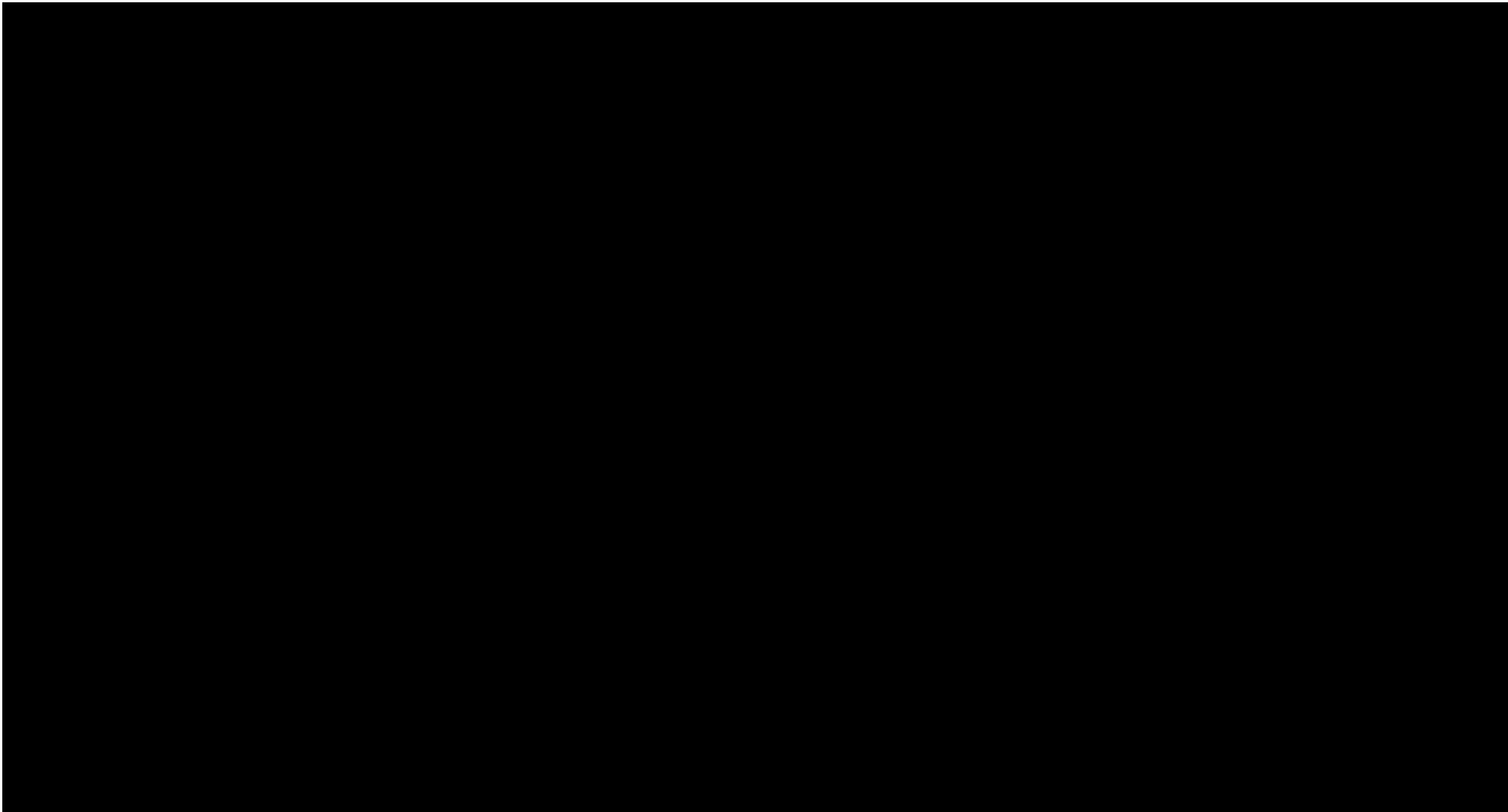
Non-network ICT operating expenditure per customer



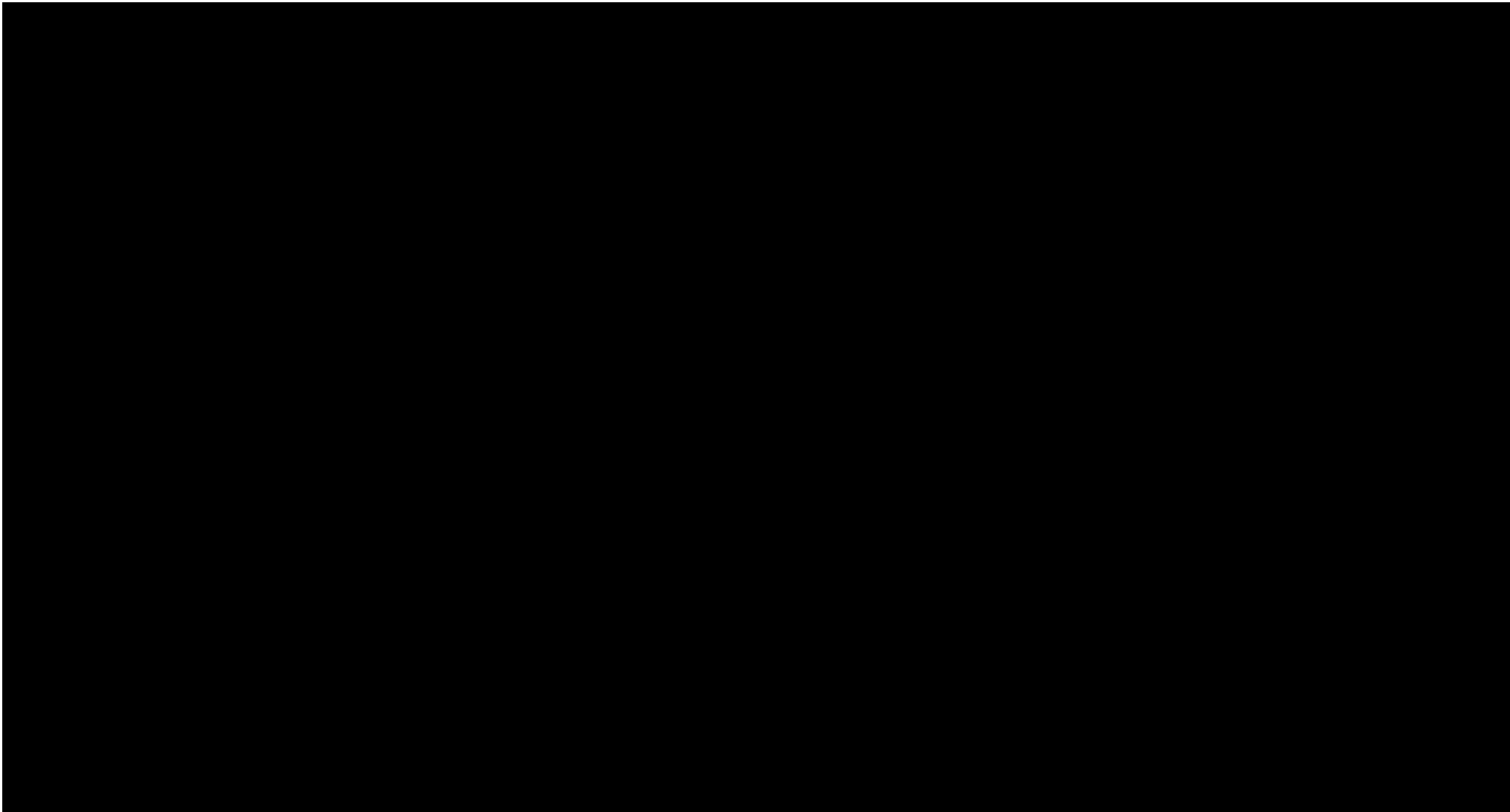
Non-network ICT operating expenditure per employee



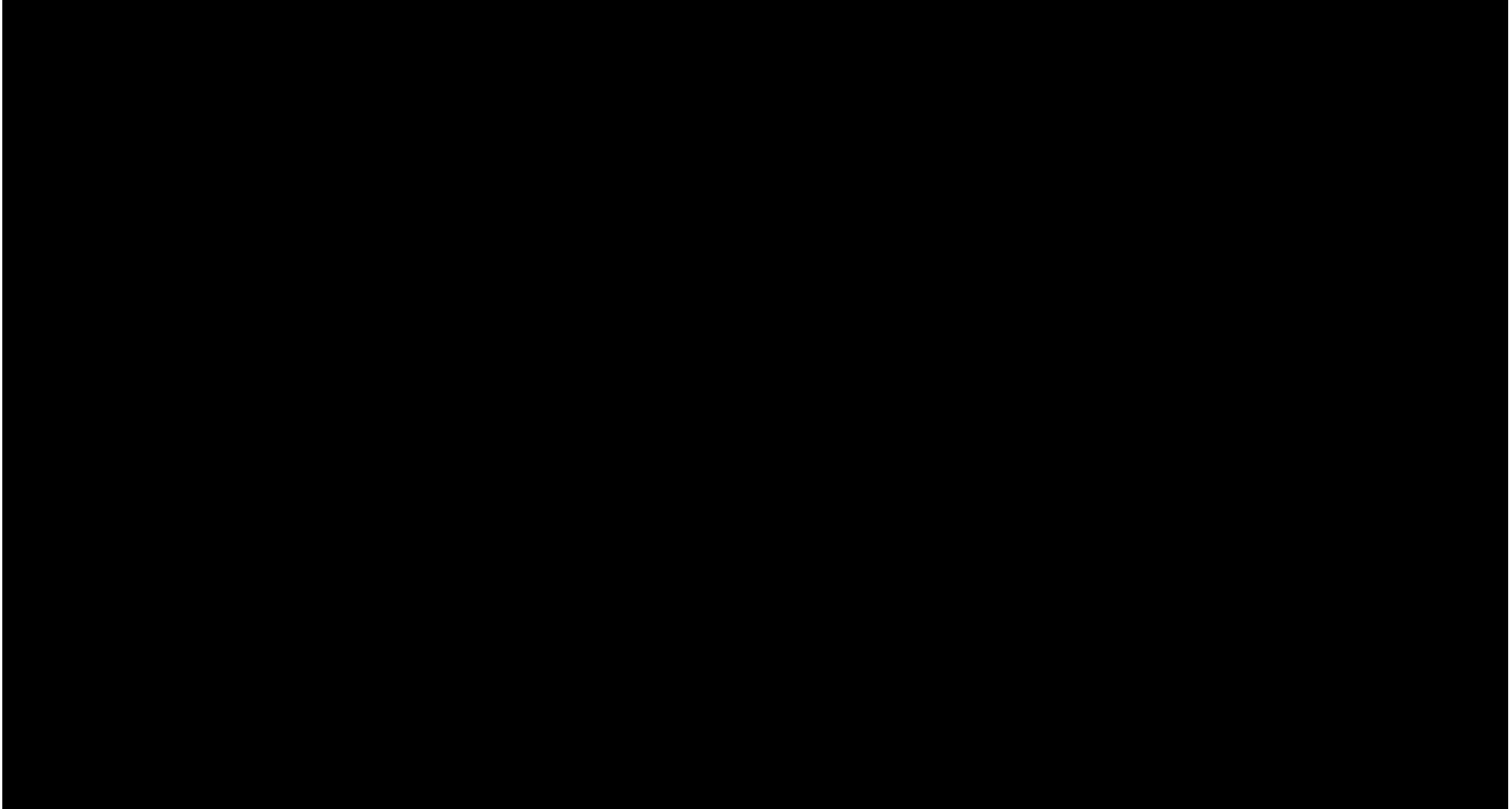
Non-network ICT operating expenditure per end user



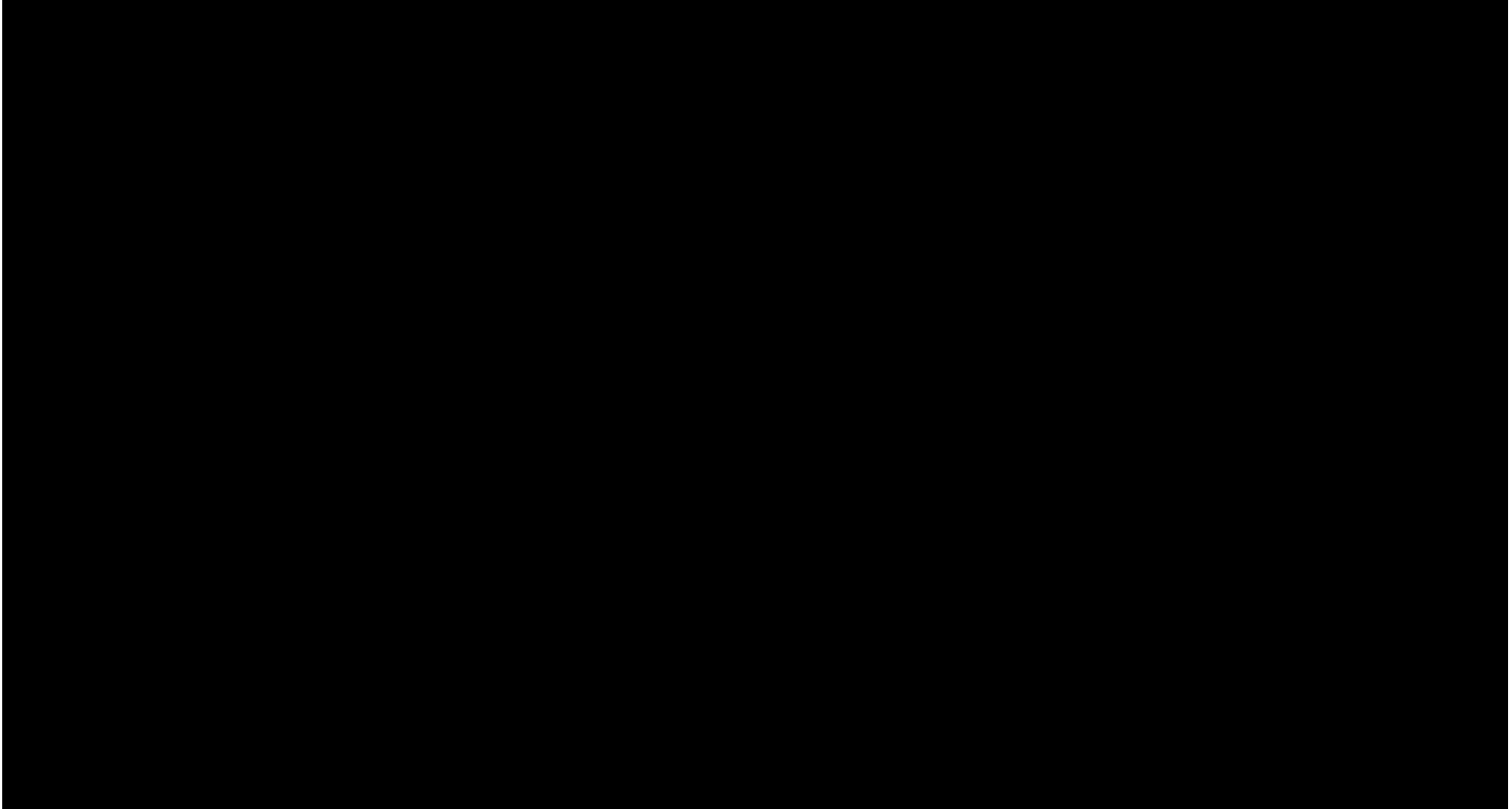
Non-network ICT operating expenditure per device



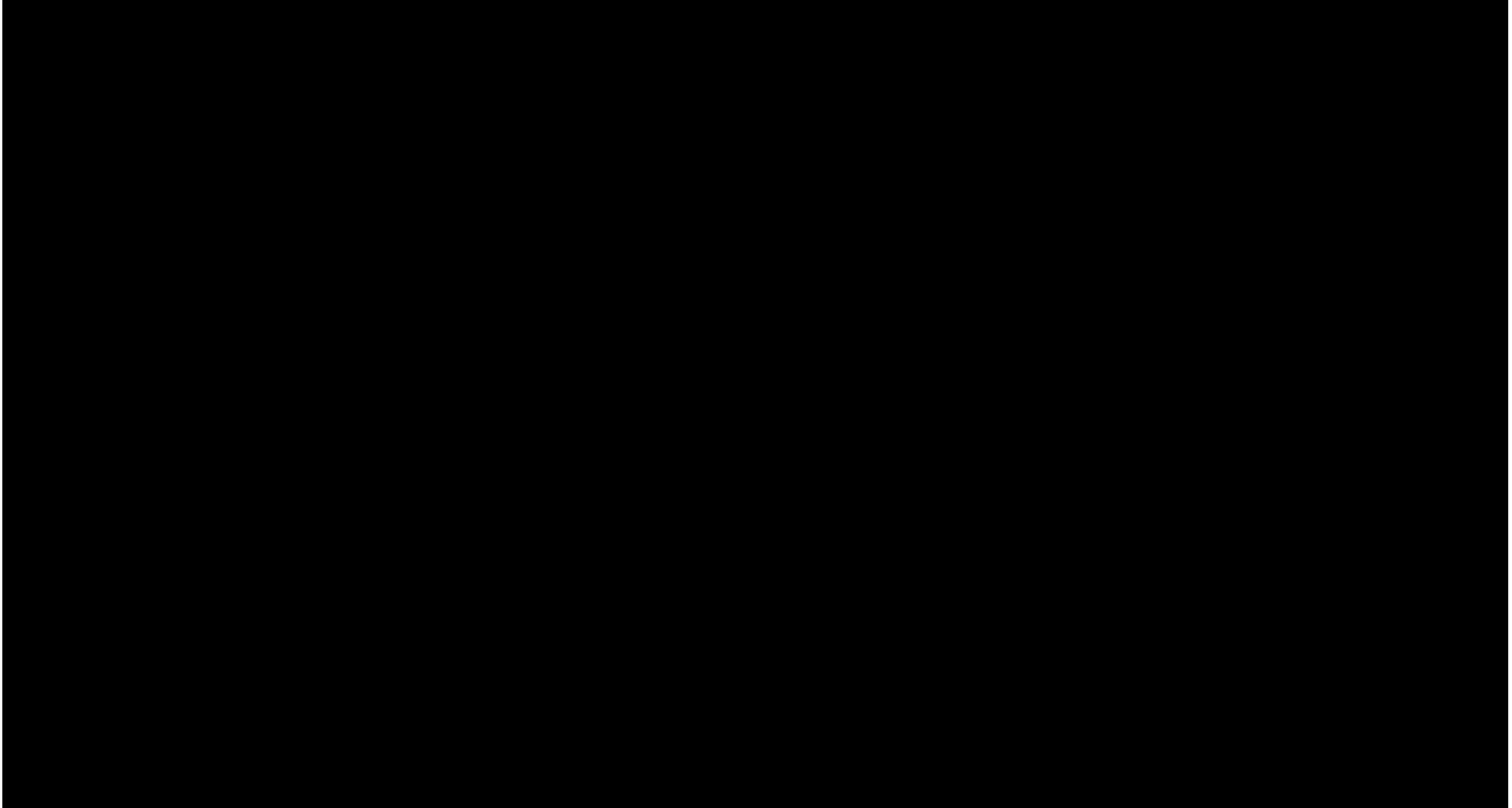
Non-network ICT operating expenditure (client device + recurrent) per customer



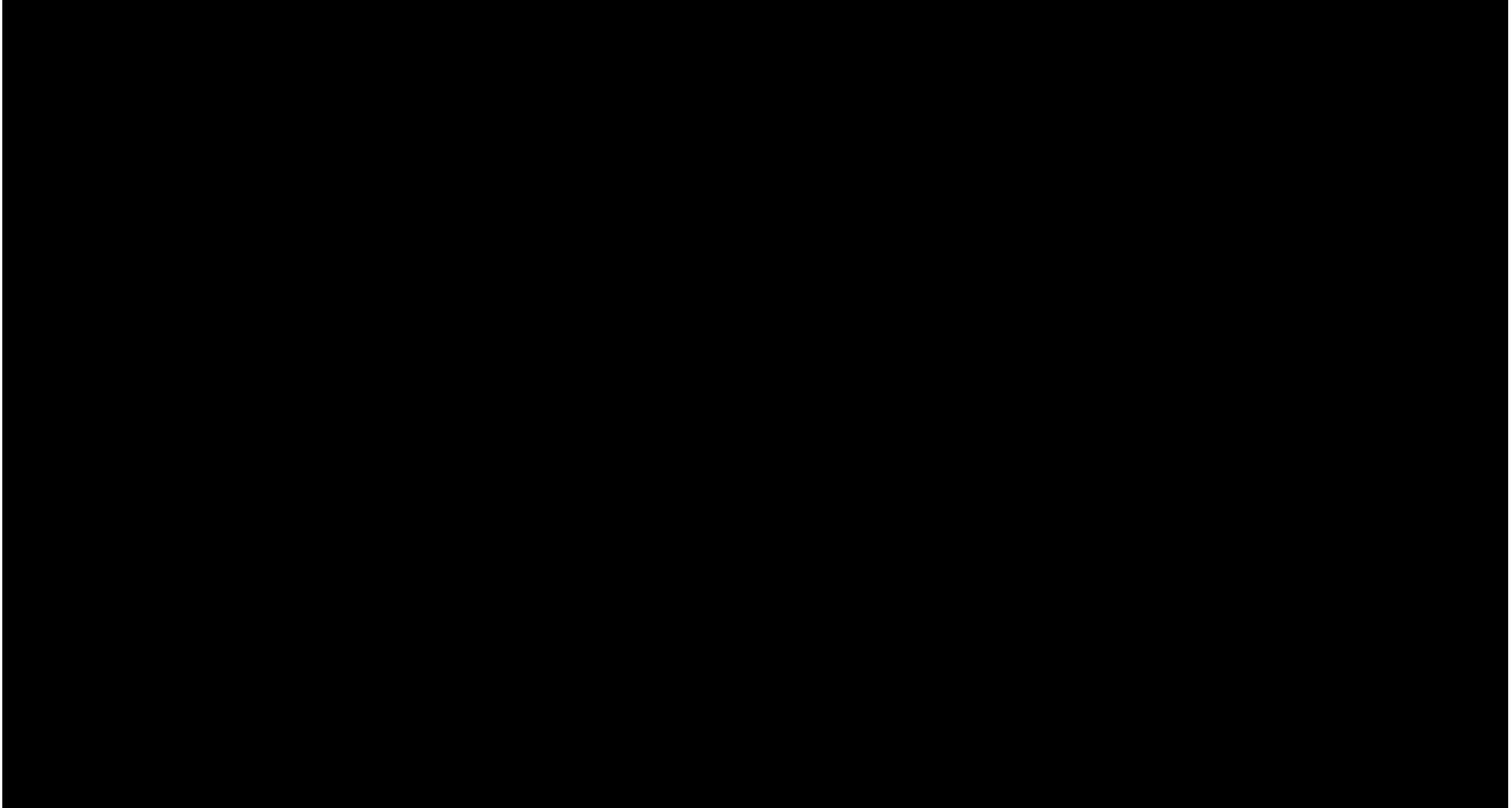
Non-network ICT operating expenditure (client device + recurrent) per employee



Non-network ICT operating expenditure (client device + recurrent) per end user



Non-network ICT operating expenditure (client device + recurrent) per device





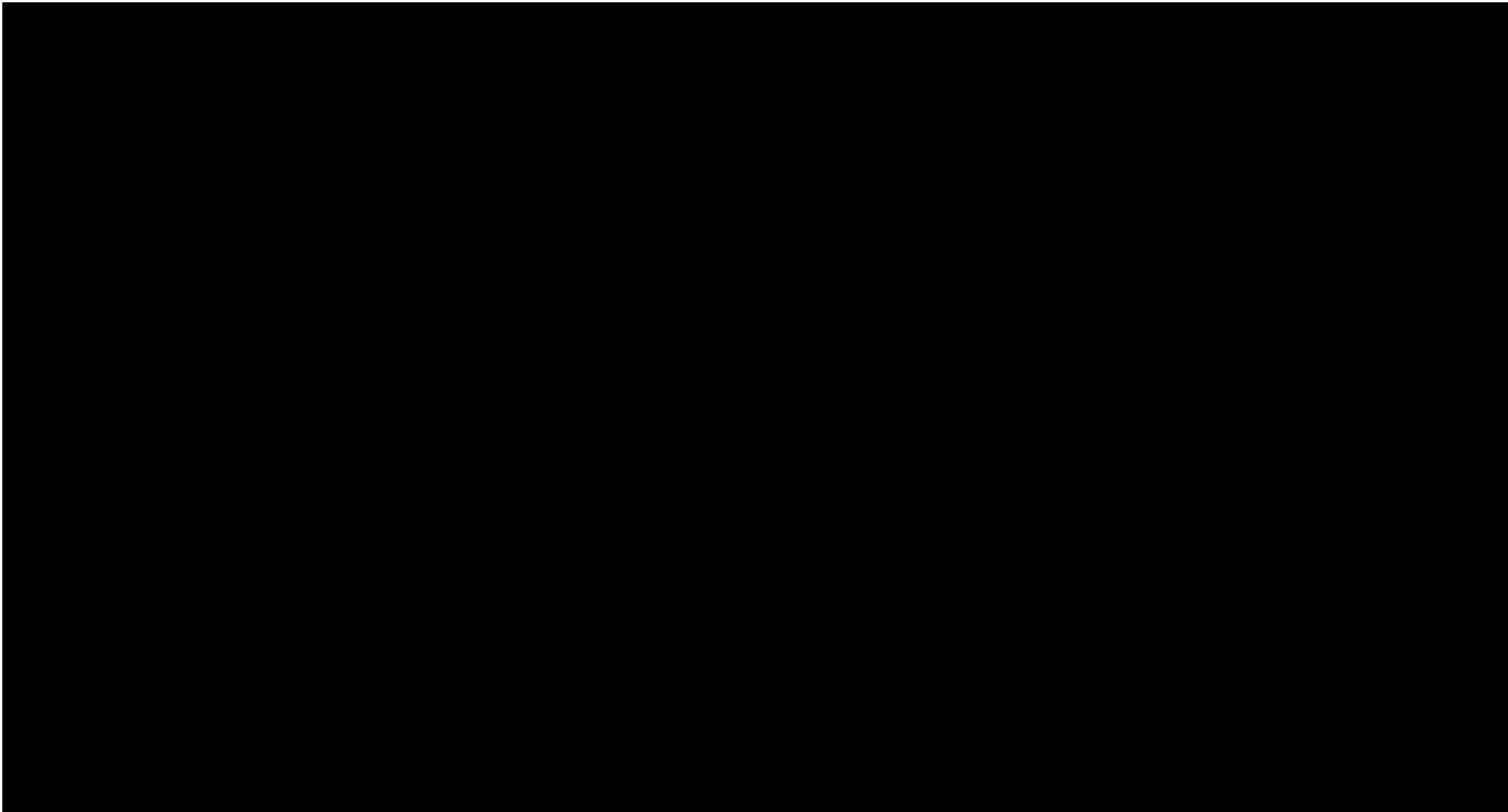
Regulatory Technology Benchmarks

TNSP

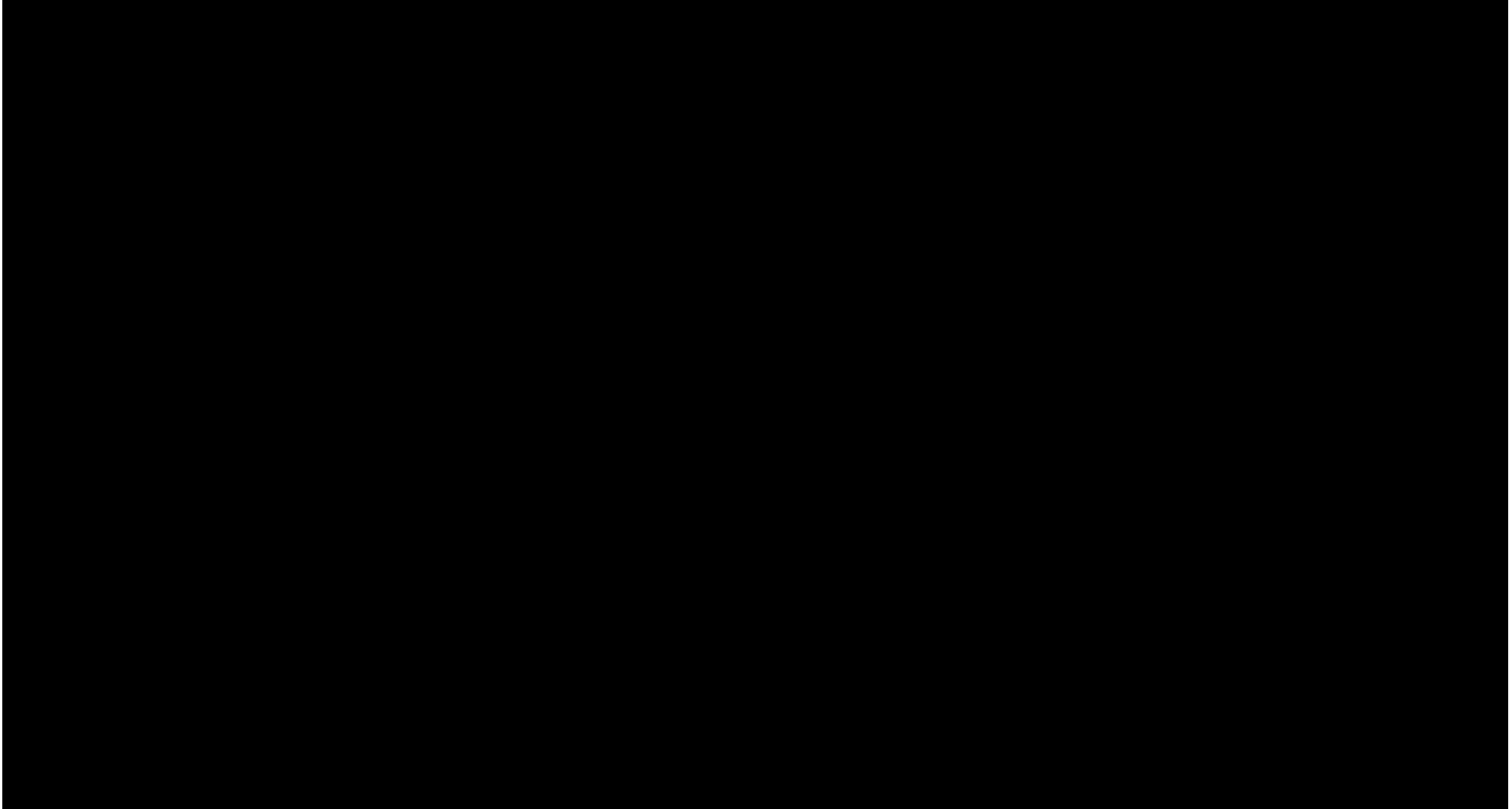
Non-network ICT Total Expenditure Metrics

- Non-network ICT total expenditure per customer, and
- Non-network ICT total expenditure as a % of total expenditure.

Non-network ICT total expenditure per customer



Non-network ICT total expenditure as a % of total expenditure





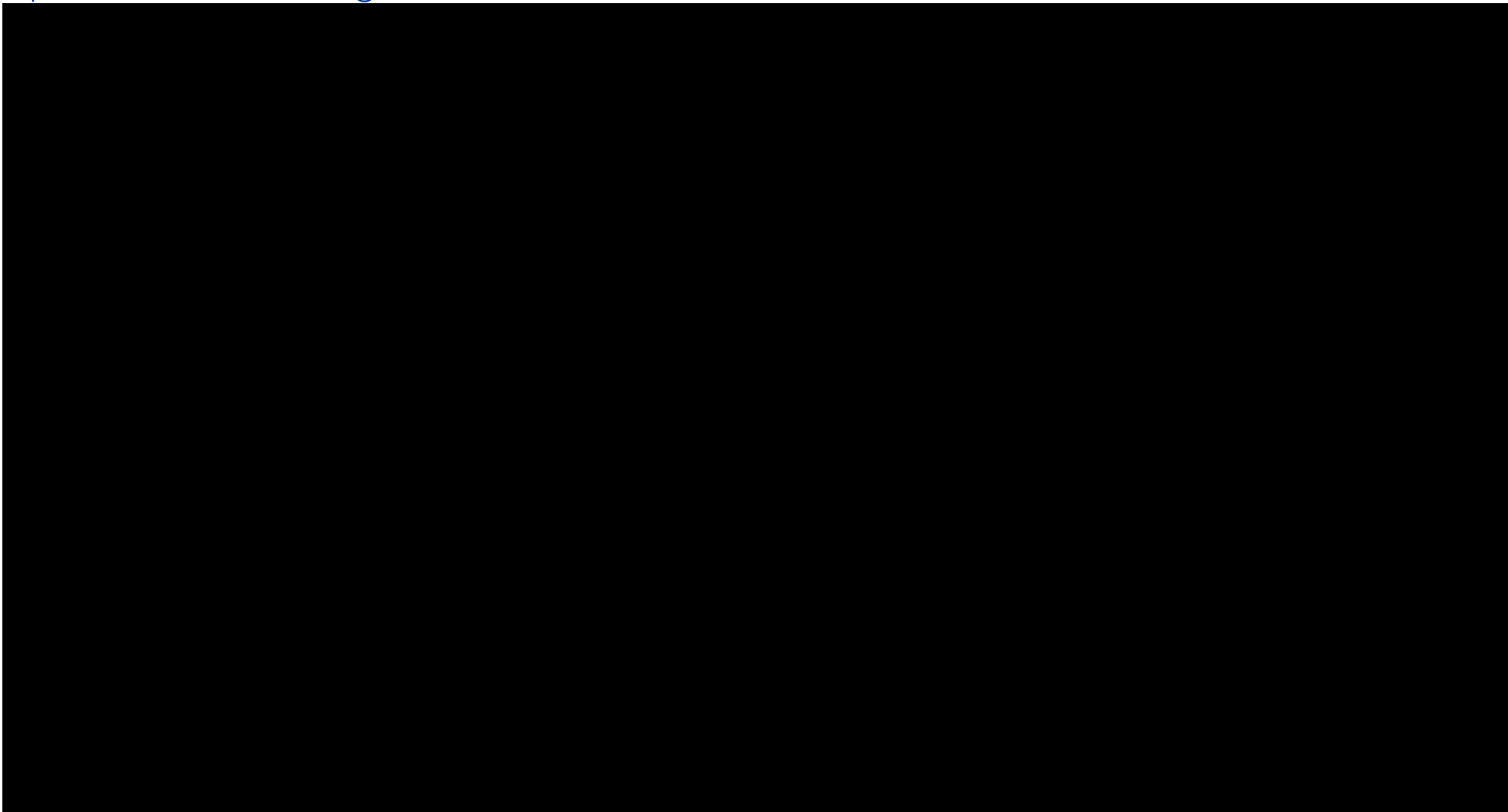
Regulatory Technology Benchmarks

TNSP

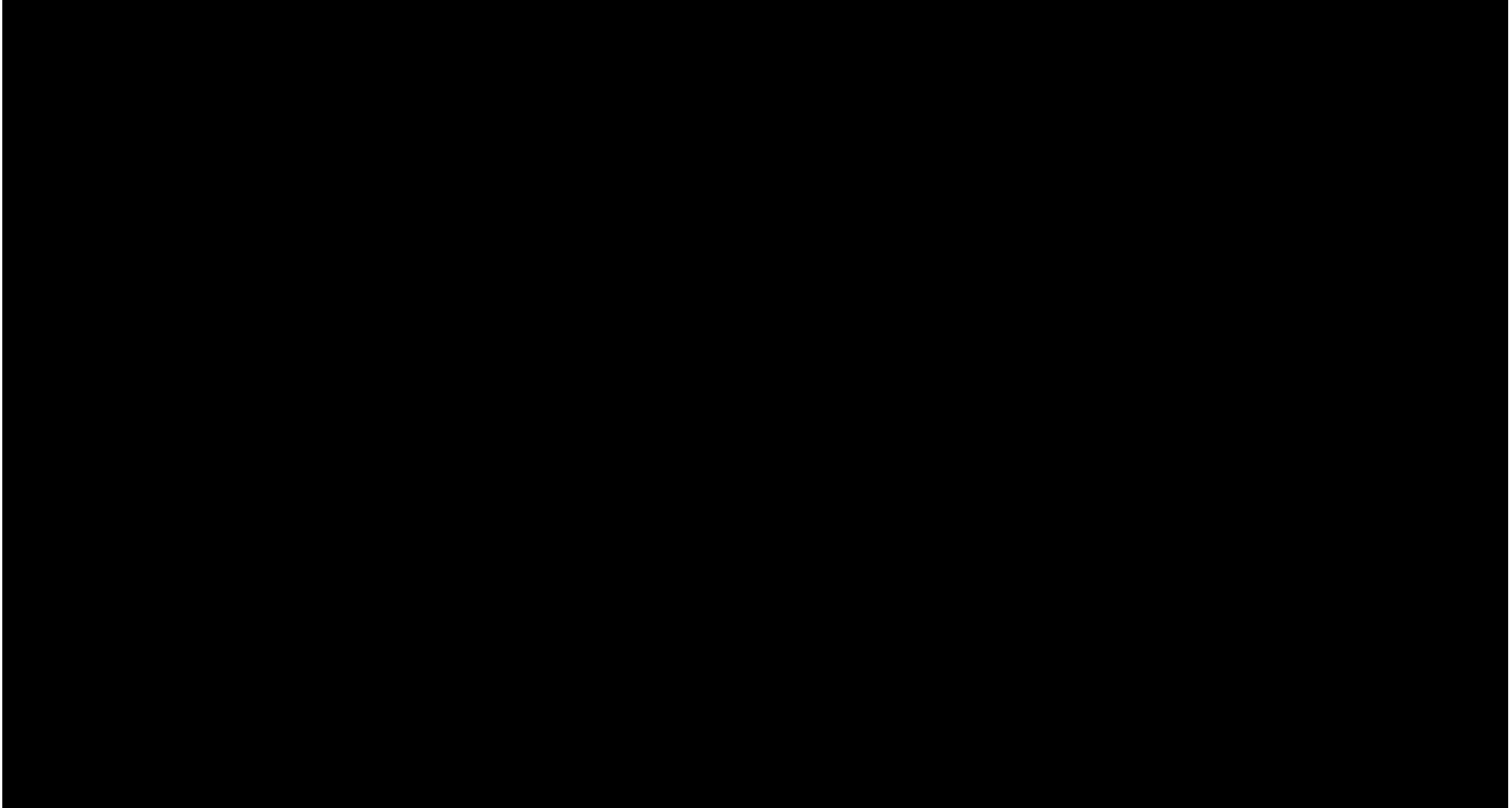
SCADA, Network Control
Metrics

- SCADA & Network Control non-routine maintenance operating expenditure per km circuit length, and
- SCADA & Network Control routine maintenance operating expenditure per km circuit length.

SCADA & Network Control non-routine maintenance operating expenditure per km circuit length



SCADA & Network Control routine maintenance operating expenditure per km circuit length





Regulatory Technology Benchmarks

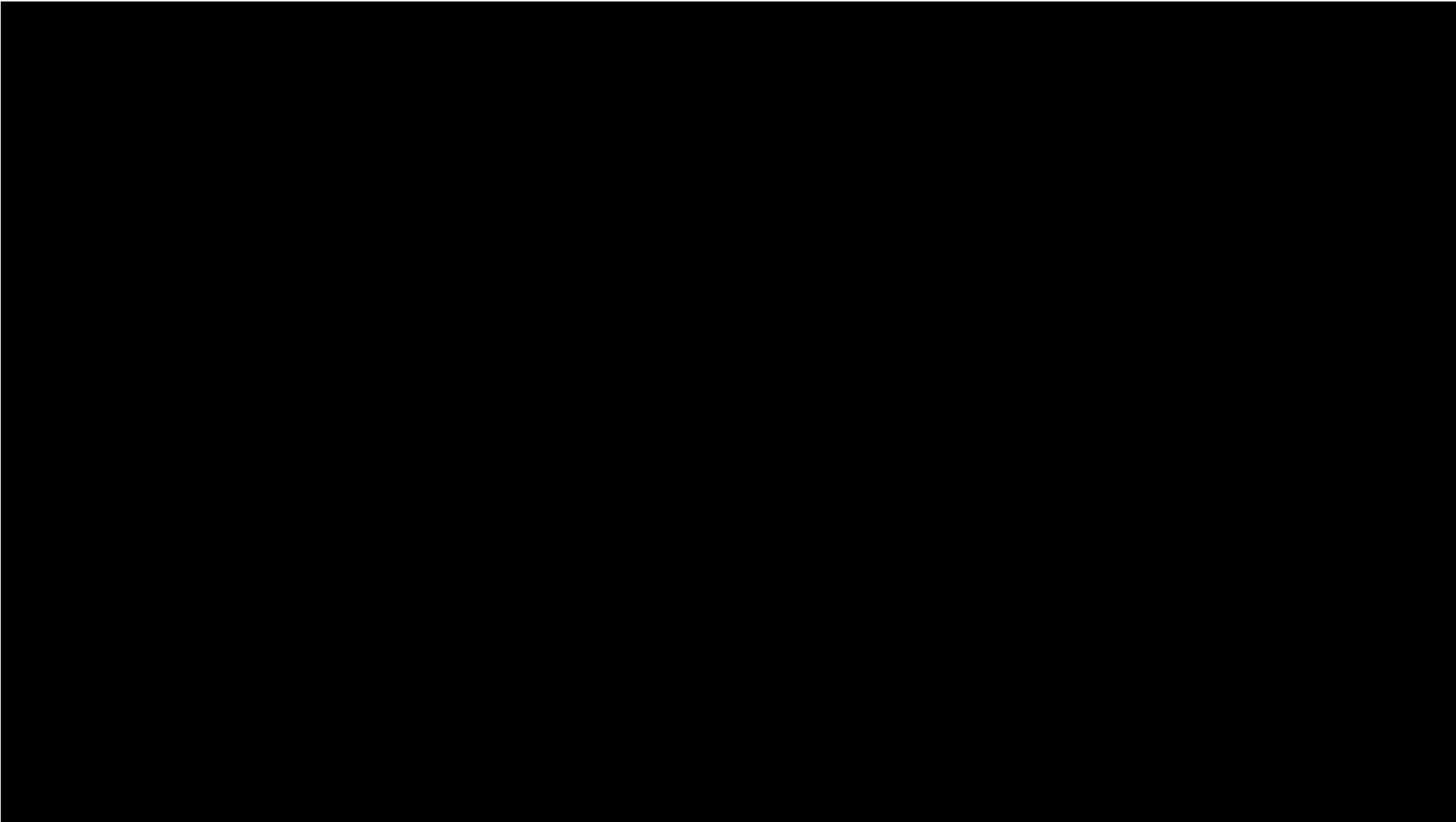
TNSP & DNSP

Regulatory & Industry Programs

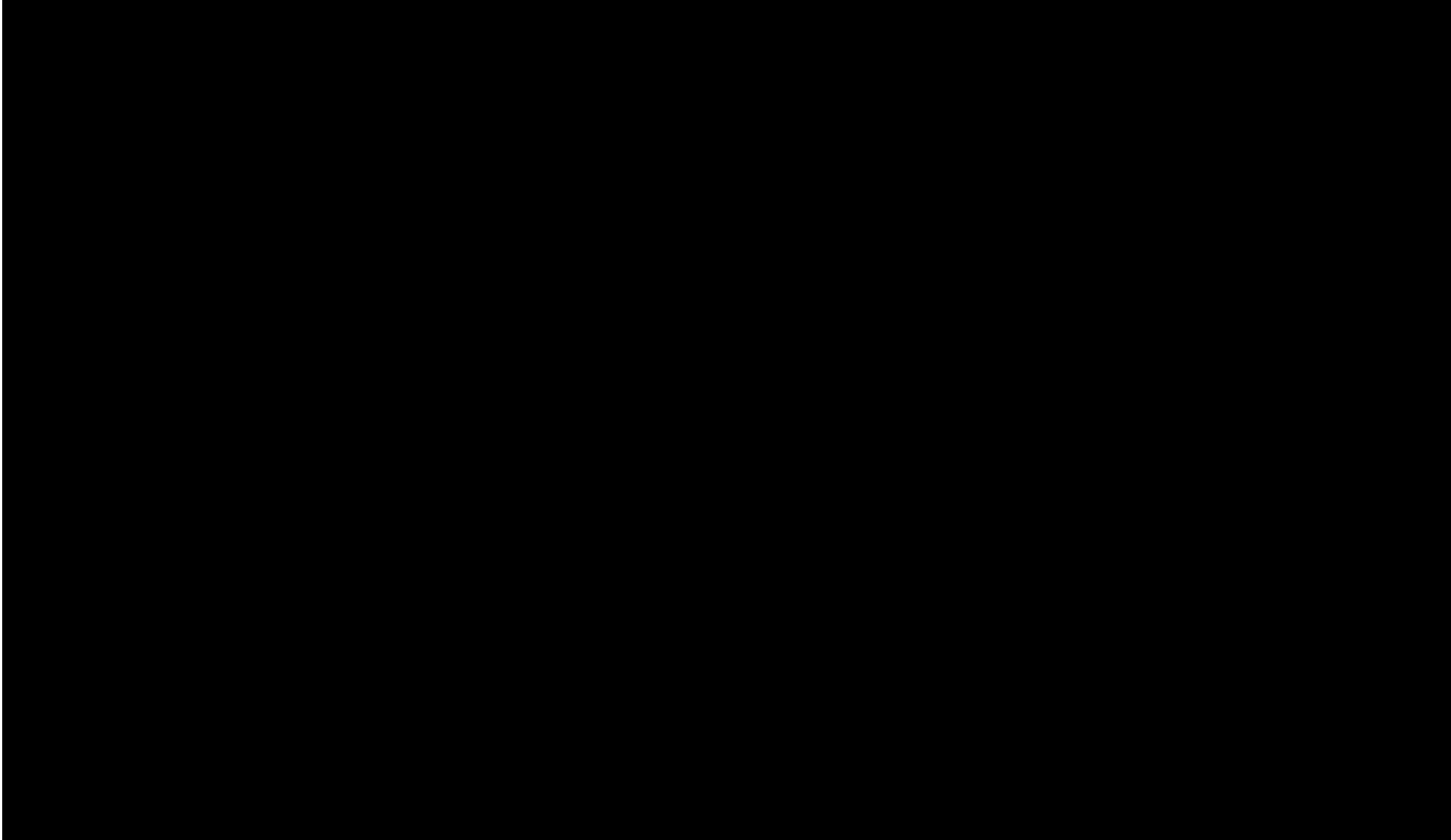
- Power of Choice

- Power of Choice – Approach and Planned Investments:
 - Distribution,
 - Metering, and
 - Consumer Information.

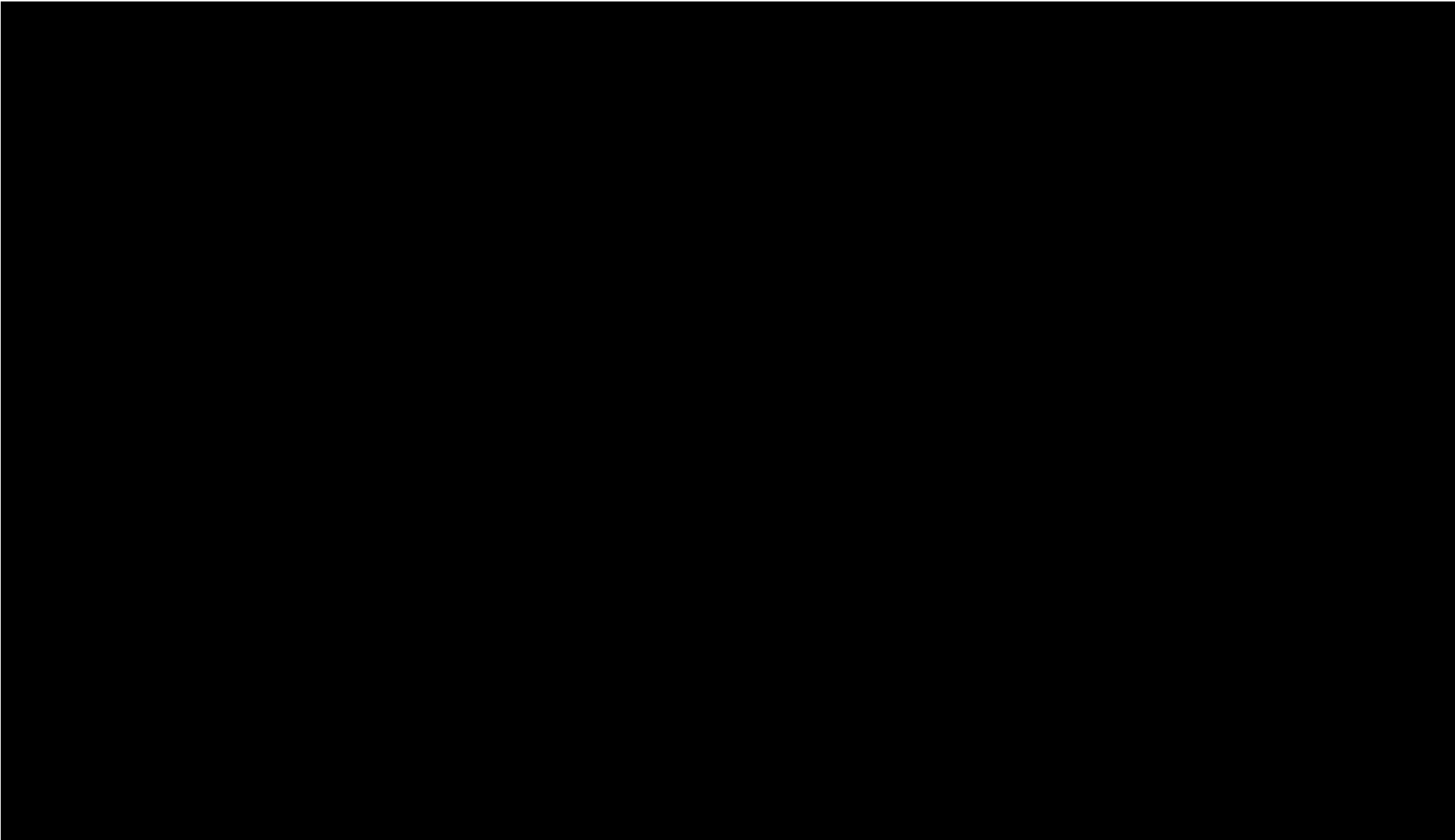
Regulatory Projects – Power of Choice (Distribution)



Regulatory Projects – Power of Choice (Metering)



Regulatory Projects – Power of Choice (Consumer Information)





Regulatory Technology Benchmarks

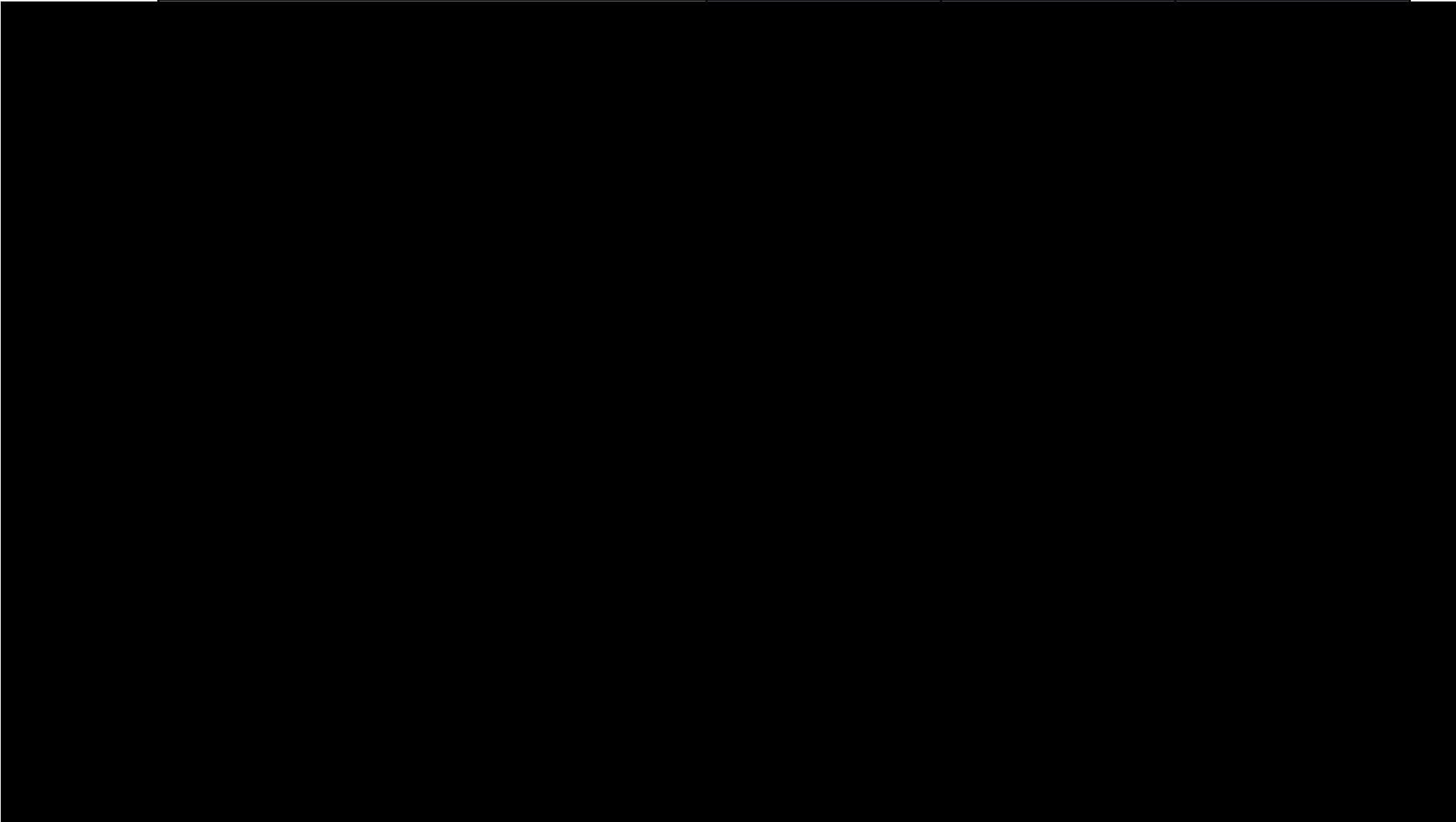
TNSP & DNSP

Regulatory & Industry Programs

- RINS Reporting

- RINS Reporting – Approach and Planned Investments.

Regulatory Projects - RINS Reporting

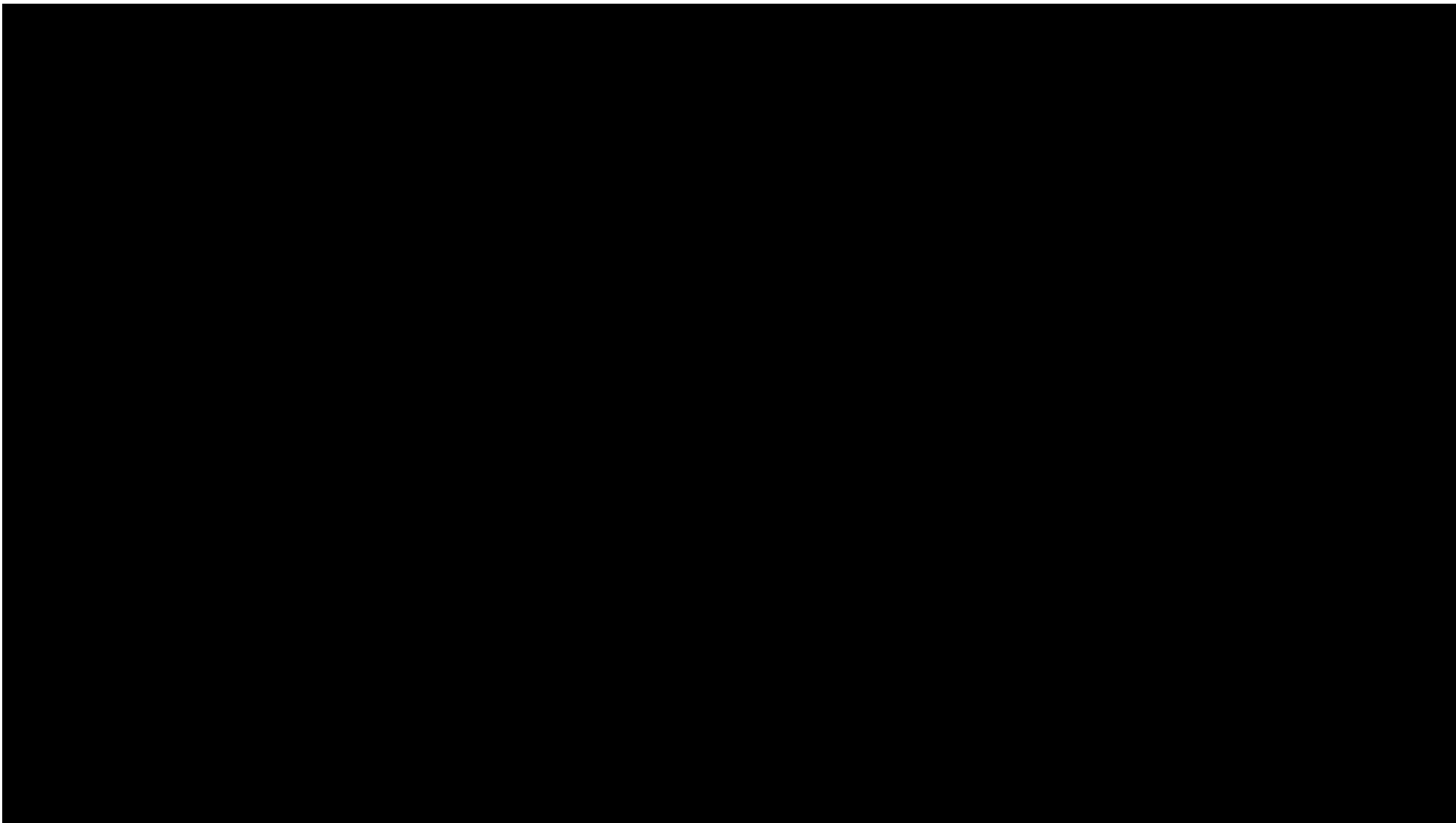




Appendix



Appendix A - CPI adjustment from \$Nominal to \$Real





kpmg.com.au

kpmg.com.au/app



© 2017 KPMG, an Australian partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative (“KPMG International”), a Swiss entity. All rights reserved.

The KPMG name and logo are registered trademarks or trademarks of KPMG International.

Liability limited by a scheme approved under Professional Standards Legislation.

The information contained in this document is of a general nature and is not intended to address the objectives, financial situation or needs of any particular individual or entity. It is provided for information purposes only and does not constitute, nor should it be regarded in any manner whatsoever, as advice and is not intended to influence a person in making a decision, including, if applicable, in relation to any financial product or an interest in a financial product. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

To the extent permissible by law, KPMG and its associated entities shall not be liable for any errors, omissions, defects or misrepresentations in the information or for any loss or damage suffered by persons who use or rely on such information (including for reasons of negligence, negligent misstatement or otherwise).