Making an Impact on Climate Change
UN Sustainable Development Goals

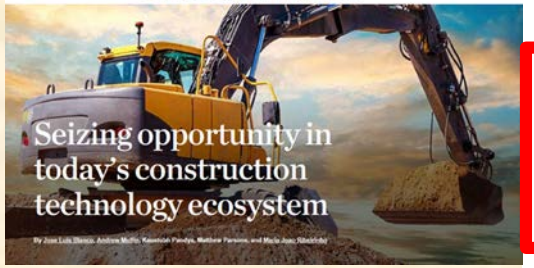
Data Driven Decisions

A Call to Action – Enabling Open Standards Data Flow

Mapping the Construction Technology Ecosystem

McKinsey&Company

Insights on Capital Projects & Infrastructure

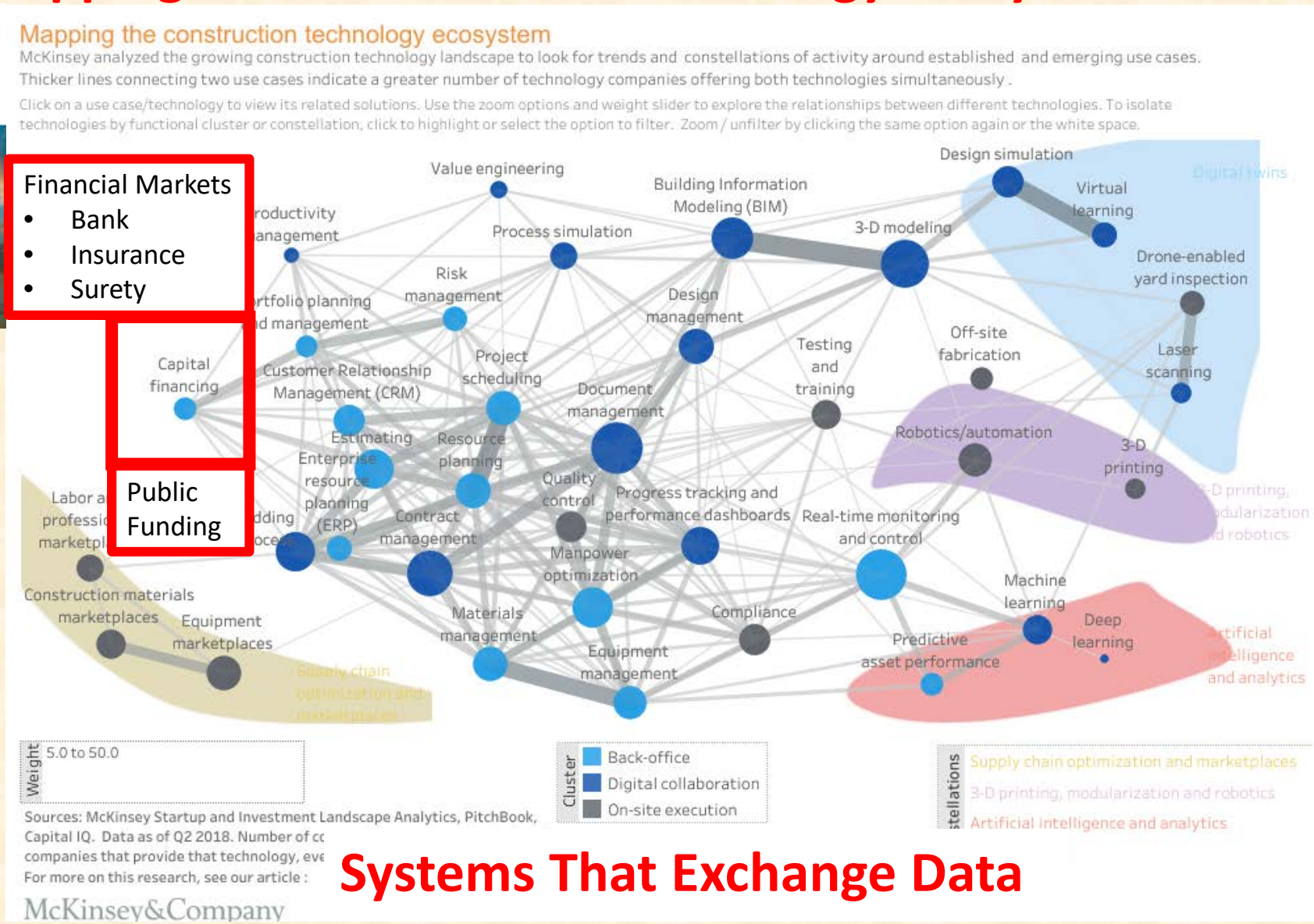


https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/seizing-opportunity-in-todays-construction-technology-ecosystem

Last year, we mapped the industry's technology ecosystem with a focus on the solutions that are proliferating in the construction phase of the project life cycle. The research shed light on the emergence of technology clusters, industry-wide technology investment of more than $10 billion in less than a decade, and the lack of integrated solutions that span three identified use case clusters: on-site execution ("field"), digital collaboration ("team"), and back-office and adjacencies ("office").

Financial Markets
- Bank
- Insurance
- Surety

Public Funding



Systems That Exchange Data

Making An Impact on Climate Change

UN Sustainable Development Goals / Data Driven Decisions

September 14, 2018

XBRL eXtensible Business Reporting Language
XBRL-CET
Construction
Energy
Transportation

Mapping the construction technology ecosystem

McKinsey&Company
Insights on Capital Projects & Infrastructure

Financial Markets

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

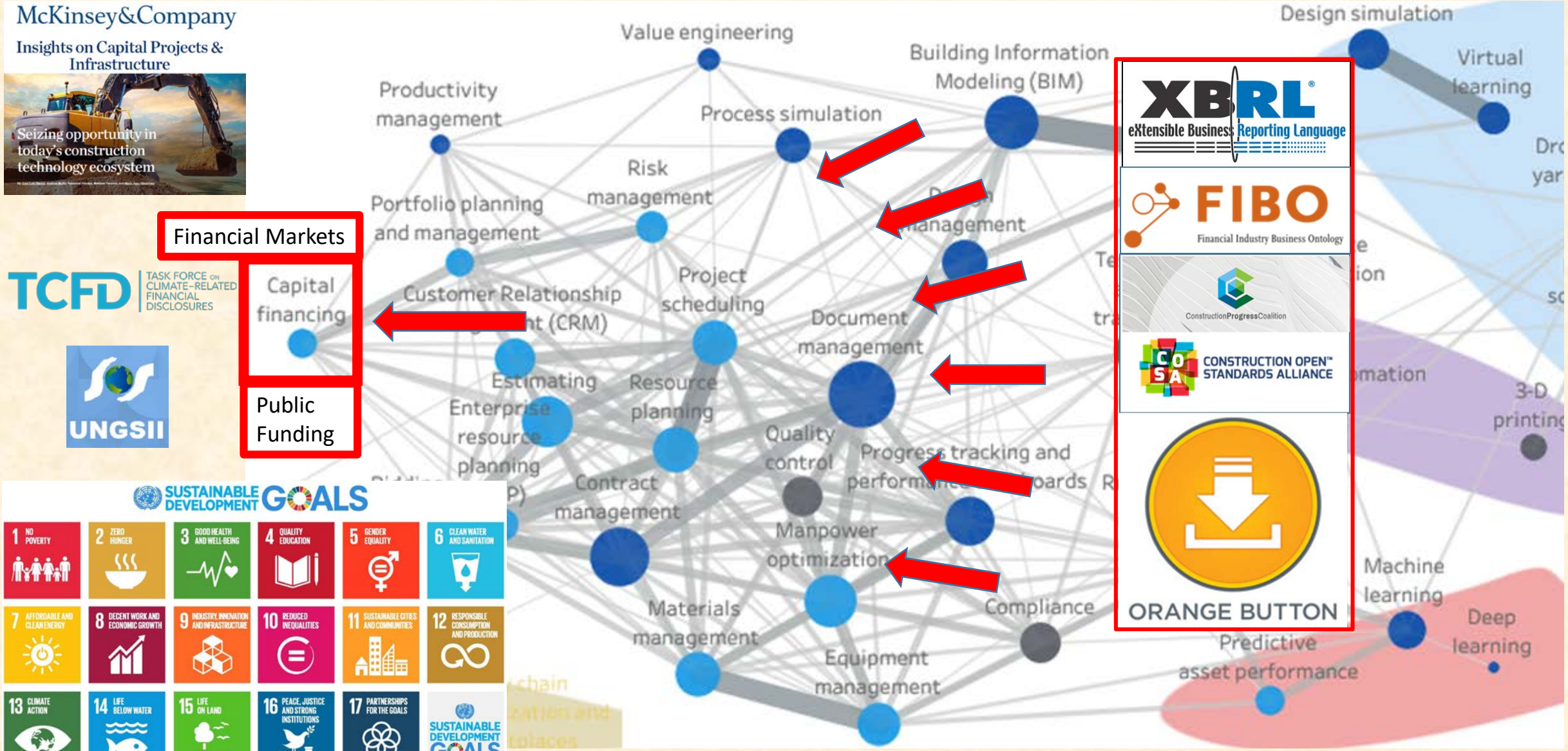
Capital financing

Public Funding

UNGSII

SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS



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Mapping the construction technology ecosystem

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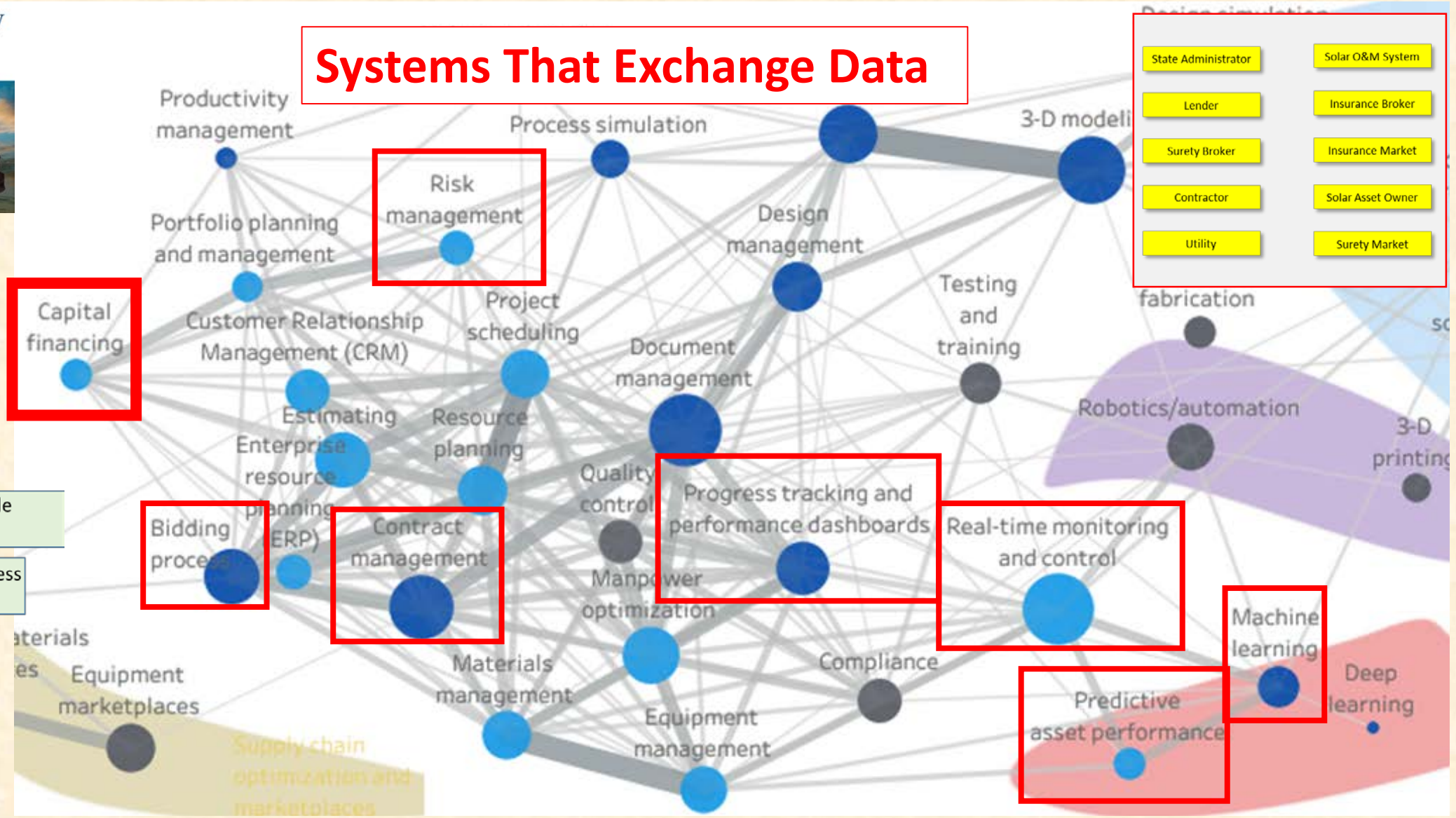
TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

UNGSII

XBRL FIBO Company Profile Data Set

XBRL FIBO Construction Progress Data Set

XBRL FIBO Surety Bond Data Set



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XBRL-CET Construction Energy Transportation

Mapping the construction technology ecosystem

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TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

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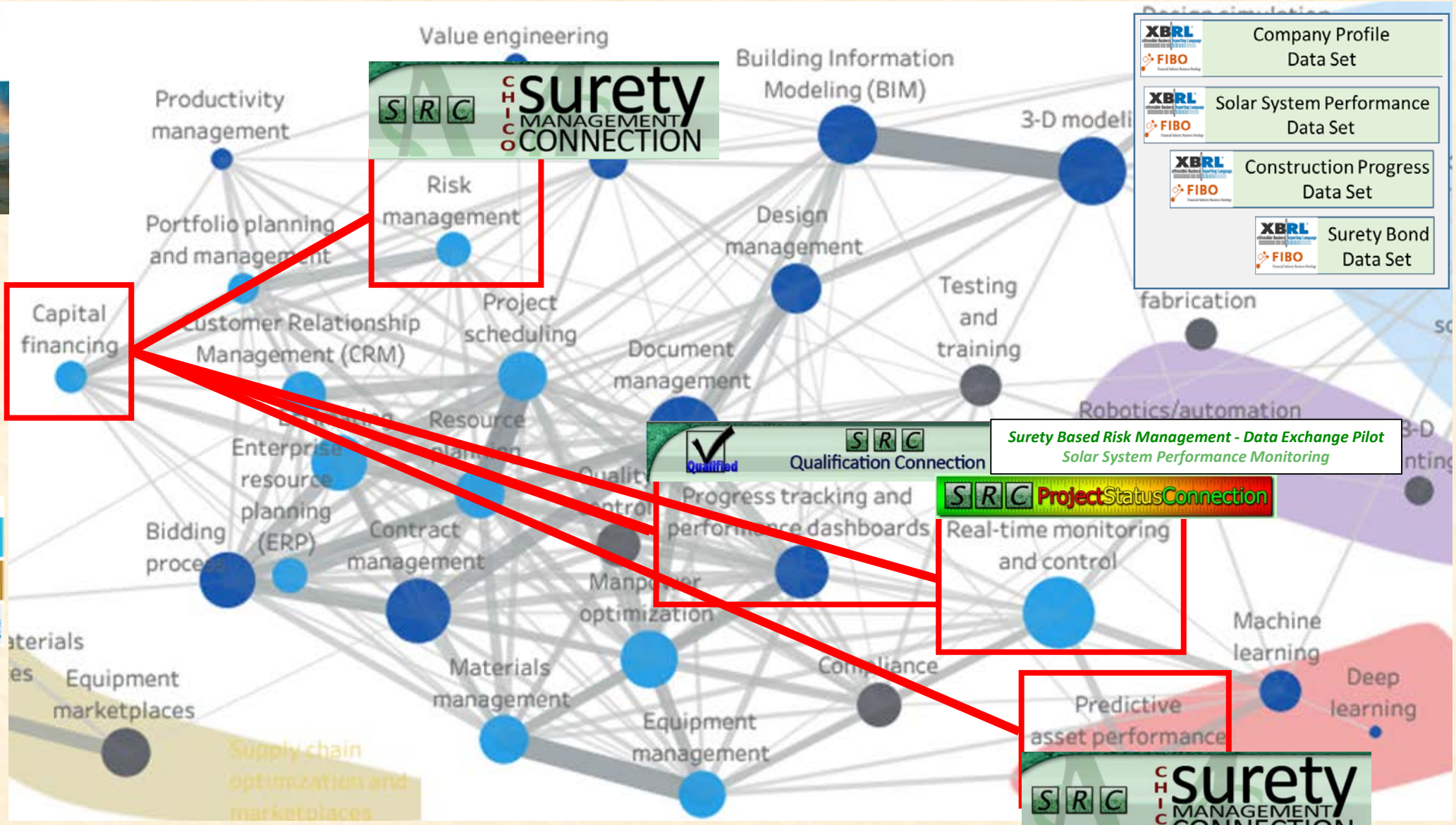

Mapping the construction technology ecosystem

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Insights on Capital Projects & Infrastructure

Demand

Financial Markets

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Capital financing

Public Funding

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Federally Recognized Machine Readable Standardized Data

Supply

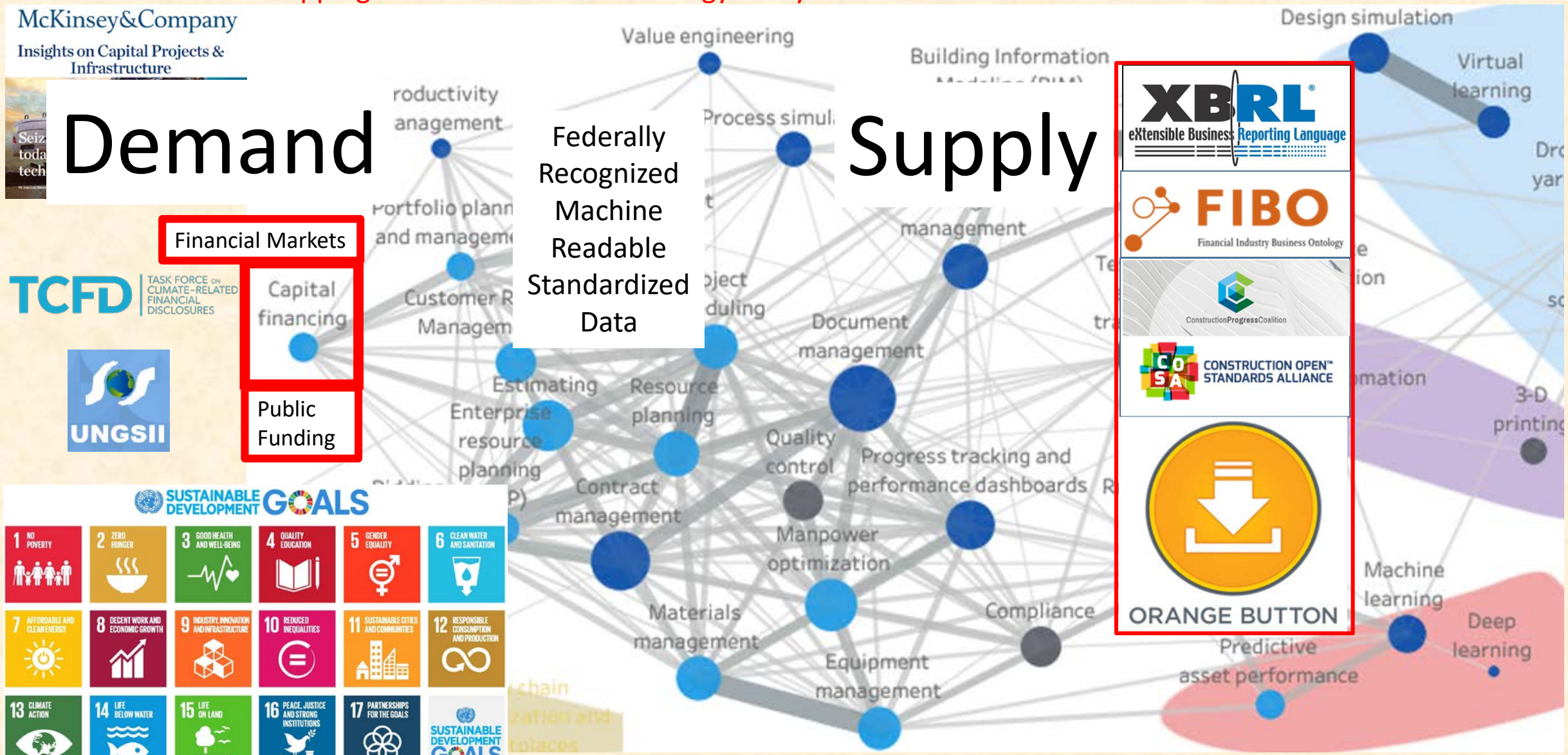
XBRL eXtensible Business Reporting Language

FIBO Financial Industry Business Ontology

ConstructionProgressCoalition

CONSTRUCTION OPEN™ STANDARDS ALLIANCE

ORANGE BUTTON



Demand

Financial Markets

TCFD Task Force on Climate-Related Financial Disclosures

Capital financing

UNGSII

Public Funding

Federally
Recognized
Machine
Readable
Standardized
Data

Impact Investing
Impact Underwriting
Impact Policy

Supply

XBRL eXtensible Business Reporting Language

FIBO Financial Industry Business Ontology

ConstructionProgressCoalition

COSA Construction Open Standards Alliance

ORANGE BUTTON

Impact Programing
Impact Campus

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Financial Markets

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

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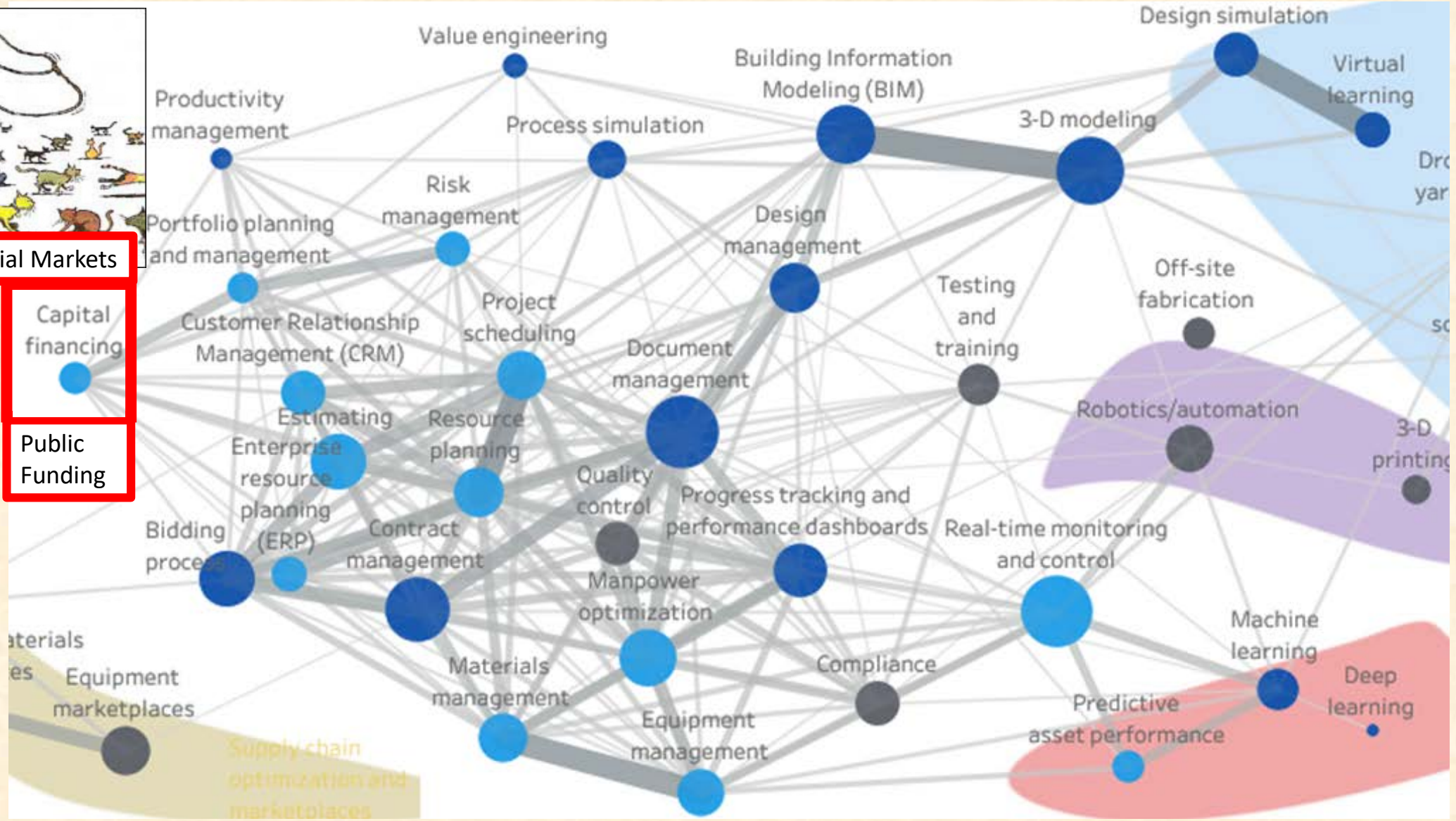
UNGSII



Making An Impact on Climate Change

UN Sustainable Development Goals / Data Driven Decisions

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XBRL-CET
Construction
Energy
Transportation

Data Flow for Bonding Contractor

Company Profile

Underwriting Data
Aggregated
Analyzed
Submitted to Surety

Underwriting Data
Analyzed
Bond Issued Electronically

Bond Data Set Available
to Stakeholders

Construction Industry

- Company Profile Data Set
- Surety Bond Data Set

Surety Industry

- Company Profile Data Set
- Surety Bond Data Set

Stakeholders

- Company Profile Data Set
- Surety Bond Data Set

Mapping the Construction Technology Ecosystem

Enabling Data Exchange From System to System

From Data Source
➡ Data Underwriting and Processing
➡ To Multiple Stakeholder Data Systems

Beginning Data Sources

Value Add Processing of Data

Final Data Distribution

- State Administrator
- Lender
- Surety Broker
- Contractor
- Utility
- Solar O&M System
- Insurance Broker
- Insurance Market
- Solar Asset Owner
- Surety Market

XBRL eXtensible Business Reporting Language
XBRL-CET
Construction
Energy
Transportation

On Bill Finance
Solar Projects
Utility Payment Bond
Page 1 of 11

Bond Type	On Bill Financing – Solar Projects- Utility Payment Bond
Surety Bond Form and Version Number	2018 03-04 XBRL-CET On Bill Financing – Solar Projects - Utility Payment Bond
Principal	
Principal Email	
Obligee	
Obligee Email	
Name of surety company	
Surety NAIC Code	
Bond Number	
Bond Amount	
Surety Email	
Name of Electronic Surety Provider	
Electronic Surety Provider Website for validating bonds	
Electronic Surety Provider Bond Verification Number	
Annual Surety Premium	
Bond Effective Date	
Contract Date	
Contract Description	
Legal Jurisdiction	
Utility Account Number	
Attachment - Schedule of Detachable Assets	

XBRL eXtensible Business Reporting Language
FIBO Financial Industry Business Ontology

Surety Bond Data Set

Data elements, including identifying the bond form to incorporate the text

Mapping the Construction Technology Ecosystem

The surety bond has two basic parts

1. The fixed text of the bond depending on the bond form
2. The data elements in the bond which need to be exchanged

XBRL-CET
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Transportation

On Bill Finance
Solar Projects
Utility Payment Bond
Page 2 of 11

KNOW ALL MEN BY THESE PRESENTS, that Principal and Surety are held and firmly bound unto Obligee in the Bond Amount as the penal amount, lawful money of the United States of America for the payment of which amount Principal and Surety bind themselves, their successors, executors, administrators and assigns, jointly and severally firmly by these presents

WHEREAS, the said Principal has entered into an On Bill finance Contract as of the Contract Date for Contract Description under Utility Account Number to finance the purchase and installation of assets including those identified in the Schedule of Detachable Assets which is provided as security for the surety under this bond in the event of default.

WHEREAS, as a condition of said Contract, the Principal is required to file security to guarantee the payment of the monthly utility bill, inclusive of both the cost of utility services and repayment of the On Bill financing.

NOW, THEREFORE THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall comply with the conditions of the Contract as referenced, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, THAT THIS BOND IS EXECUTED BY THE PRINCIPAL AND SURETY AND ACCEPTED BY THE OBLIGEE SUBJECT CONDITIONS:

Bond Effective Date and shall be continuous without amendment until canceled or exonerated.

2) This bond is automatically cancelled, and Surety exonerated, when the obligations of the Principal under the Contract have been fulfilled, or the Contract terminated by mutual consent of Obligee and Principal.

3) That this bond may be cancelled by Surety by 60 days' prior notice in writing from Surety to Principal and to Obligee that the Surety elects not to renew this bond for any such additional period.

4) Any notice of cancellation must be delivered to Obligee email with receipt acknowledged by Obligee.

r cancellation shall not affect any liability incurred or accrued under this bond prior to the effective date of such termination or nderstood and agreed that the Obligee may recover the full amount of the bond (less any previous amounts paid to Obligee Surety cancels or non-renews the bond and, within thirty (30) days prior to the effective date of cancellation or nonrenewal, ceived replacement financial security acceptable to it to replace the bond.

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Transportation

On Bill Finance
Solar Projects
Utility Payment Bond
Page 1 of 11

Bond Type	On Bill Financing – Solar Projects- Utility Payment Bond
Surety Bond Form and Version Number	2018-03-04 XBRL-CET On Bill Financing – Solar Projects - Utility Payment Bond
Principal	
Principal Email	
Obligee	
Obligee Email	
Name of surety company	
Surety NAIC Code	
Bond Number	
Bond Amount	
Surety Email	
Name of Electronic Surety Provider	
Electronic Surety Provider Website for validating bonds	
Electronic Surety Provider Bond Verification Number	
Annual Surety Premium	
Bond Effective Date	
Contract Date	
Contract Description	
Legal Jurisdiction	
Utility Account Number	
Attachment - Schedule of Detachable Assets	

Mapping the Construction Technology Ecosystem

The surety bond has two basic parts

1. The fixed text of the bond depending on the bond form
2. The data elements in the bond which need to be exchanged

XBRL eXtensible Business Reporting Language
FIBO Financial Industry Business Ontology

Surety Bond Data Set

Electronic Surety Provider

- State Administrator
- Lender
- Surety Broker
- Contractor
- Utility
- Solar O&M System
- Insurance Broker
- Insurance Market
- Solar Asset Owner
- Surety Market

Final Data Distribution

Making An Impact on Climate Change

UN Sustainable Development Goals / Data Driven Decisions

September 14, 2018

XBRL-CET
Construction
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Transportation

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Company Profile Data Set

Surety Broker
Online Questionnaire

California Public Utilities Commission

THE SUPPLIER CLEARINGHOUSE

CONSTRUCTION OPEN STANDARDS ALLIANCE

agcXML

ConsensusDocs

Any Contractor, Bank, Insurance Company, Utility, State or Federal database where the system provides the customer/client the option to securely download a standardized company profile as an export than can be imported

Beginning Data Sources

Surety Broker
Agency Management System

- Project Performance Data
- Project Procurement Data
- Internet Search
- Reference Data
- Bank Data - Token
- State and Federal Data
- CPA Data

Value Add Processing of Data

Surety Company
Underwriting System

Electronic Surety Provider

Construction Progress Data Set

Company Profile Data Set

Surety Bond Data Set

- State Administrator
- Lender
- Surety Broker
- Contractor
- Utility
- Solar O&M System
- Insurance Broker
- Insurance Market
- Solar Asset Owner
- Surety Market

Final Data Distribution

Making An Impact on Climate Change

UN Sustainable Development Goals / Data Driven Decisions

September 14, 2018

XBRL-CET
Construction
Energy
Transportation

Data Flow for Bonding Contractor
Surety Resource Connection

Company Profile

Underwriting Data
Aggregated
Analyzed
Submitted to Surety

Submissions
Tracked

Underwriting Data
Analyzed
Bond Issued Electronically

Bond Data Set Available
to Stakeholders

Company Profile
Data Set

Surety Resource connection

CHICO COMMON APPLICATION

California Public Utilities Commission

THE SUPPLIER CLEARINGHOUSE

CONSTRUCTION OPEN STANDARDS ALLIANCE

agcXML

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CHICO surety MANAGEMENT CONNECTION

Surety Online Management System

Submissions Requiring Review	24	Review
Submissions Executed	32	Review
Submissions Declined	12	Review
Submissions Requiring Printing	56	Review
Execution Reports to Import to Insurvision	34	Review
Month to Date Activity	1,245	Review
Year to Date Activity	32,125	Review

ProjectStatusConnection

CHICO BID LIST CONNECTION

Qualification Connection

Reference Data

Bank Data - Token

State and Federal Data

CPA Data

Construction Progress Data Set

Company Profile Data Set

Surety Company Underwriting System

Electronic Surety Provider

Surety Bond Data Set

State Administrator

Lender

Surety Broker

Contractor

Utility

Solar O&M System

Insurance Broker

Insurance Market

Solar Asset Owner

Surety Market

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XBRL eXtensible Business Reporting Language
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Transportation

Data Flow for Bonding Solar System

Surety Resource Connection

Company Profile

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Submissions
Tracked

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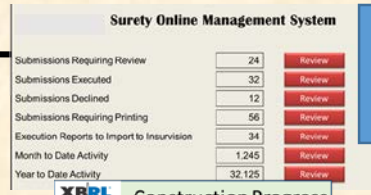

Surety Company
Underwriting System

Electronic Surety Provider

XBRL FIBO Construction Progress Data Set

XBRL FIBO Company Profile Data Set

XBRL FIBO Surety Bond Data Set

Third Party O&M Provider

Internal Solar Monitoring System

State Administrator

Lender

Surety Broker

Contractor

Utility

Solar O&M System

Insurance Broker

Insurance Market

Solar Asset Owner

Surety Market

XBRL FIBO Solar System Performance Data Set

Any Contractor, Bank, Insurance Company, Utility, State or Federal database where the system provides the customer/client the option to securely download a standardized company profile as an export than can be imported

Surety Based Risk Management - Data Exchange Pilot
Solar System Performance Monitoring