

ISDA & ICMA: CDM for Repo



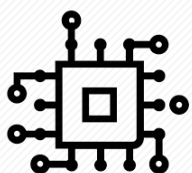
ISDA. C D M

INDUSTRY PARTICIPANTS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	JL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC	AD</
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[illegible]

Vendor Z



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ISDA CDM

EXAMPLE APPLICATION: SFTR REPORTING

End-to-End Implementation Based on CDM

Subject: VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *

VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *
SETTLE DATE: 03/28/19 ISIN: DE0001102465 CUSIP: AW4161880
ROLL: N SETTLEMENT MARKET TENOR: SPREAD: 0.0000
PRICE 107.6179452 107.617945 FIXED RATE(360): -0.3100%
MTY YLD -0.4996321 -0.4996321 COLLATERAL: 100.00% of money
ACCRUED 0.0520548 0.0520548 AS OF: 03/27/19 09:51
PX+ACC 107.6700000 107.6700000
OF BONDS: 100000000 X SETTLE MONEY 107670000.00
TERMINATION DT: 03/29/19 (1 days) CALL OPTION: NO
MONEY AT TERMINATION: WIRED AMOUNT: 107,670,000.00
{VCON <GO>} to Automate REPO INTEREST: -927.16
TERMINATION MONEY: 107,669,072.84

Marketplace Message
(e.g. BBG VCON)

```
<repo>  
<fixedRateSchedule>  
  <initialValue>-0.31</initialValue>  
</FixedRateSchedule>  
<dayCountFractions>30/360</dayCountFractions>  
<duration>Term</duration>  
<initialMargin> </initialMargin>  
<nearLeg>  
  <buyerPartyReference href="Party1" />  
  <sellerPartyReference href="Party2" />  
  <settlementDate>  
    <adjustableDate> </adjustableDate>  
  </settlementDate>  
  <settlementAmount>  
    <currency>EUR</currency>  
    <amount>107670000.0</amount>  
  </settlementAmount>  
  <deliveryMethod>DeliveryVersusPayment</deliveryMethod>  
  <collateral>  
    <nominalAmount> </nominalAmount>  
    <cleanPrice>107.6179452</cleanPrice>  
    <accruals>0.0520548</accruals>  
    <dirtyPrice>107.67</dirtyPrice>  
    <assetReference href="asset-ref-1" />  
  </collateral>  
</nearLeg>  
<farLeg id="forwardLeg"> </farLeg>  
<bond id="asset-ref-1">
```

Firm's Electronic Record

This lives in the CDM
(Open Source)

```
"contractualProduct": {  
  "economicTerms": {  
    "payout": {  
      "interestRatePayout": [ < > ],  
      "securityPayout": [  
        {  
          "initialMargin": { < > },  
          "meta": { < > },  
          "repoDuration": "TERM",  
          "securityLeg": [  
            { < > },  
            { < > }  
          ],  
          "securityValuation": [ < > ]  
        }  
      ],  
    },  
    "rosettaKeyValue": "8f3ac8a3"  
  },  
  "productIdentification": {  
    "productQualifier": "RepurchaseAgreement"  
  }  
},
```

Normalised Trade Event

```
<ns0:New>  
<ns0:TxId>ABC1000244</ns0:TxId>  
<ns0:ExctgPty>10677PQLTCSJ119FLFVA</ns0:ExctgPty>  
<ns0:InvstmtPtyInd>true</ns0:InvstmtPtyInd>  
<ns0:SubmitgPty>10677PQLTCSJ119FLFVA</ns0:SubmitgPty>  
<ns0:Buyr> </ns0:Buyr>  
<ns0:Sellr> </ns0:Sellr>  
<ns0:OrdTrnsmssn>  
  <ns0:TrnsmssnInd>false</ns0:TrnsmssnInd>  
</ns0:OrdTrnsmssn>  
<ns0:Tx>  
  <ns0:TradDt>2019-03-27</ns0:TradDt>  
  <ns0:TradgPcty>DEAL</ns0:TradgPcty>  
  <ns0:Prcl>107.67</ns0:Prcl>  
  <ns0:CtryOfBrnch>UK</ns0:CtryOfBrnch>  
</ns0:Tx>  
<ns0:FinInstrm>  
  <ns0:Othr>  
    <ns0:FinInstrmGnlAttrbts>  
      <ns0:ClassfctnTp>REPO</ns0:ClassfctnTp>  
      <ns0:NtlCcy>EUR</ns0:NtlCcy>  
    </ns0:FinInstrmGnlAttrbts>  
    <ns0:DerivInstrmAttrbts> </ns0:DerivInstrmAttrbts>  
  </ns0:Othr>  
</ns0:FinInstrm>  
<ns0:InvstmtDcsnPrsn> </ns0:InvstmtDcsnPrsn>  
<ns0:ExctgPrsn> </ns0:ExctgPrsn>  
<ns0:AddtlAttrbts> </ns0:AddtlAttrbts>  
</ns0:New>  
</ns0:Tx>
```

SFTR Report
Extract
(ISO 20022)

report ESMA_SFTR regulation "(EU) 2015/2365" in T+1 when InScopeOfEvent
using standard ISO_20022 with fields
TypeOfSFT
UnitPrice

reporting rule TypeOfSFT
from
if ProductIdentification -> productType = "RepurchaseAgreement"
then "REPO"
else if ProductIdentification -> productType = "Buy_Sell_Back"
then "SBSC"
else ""

reporting rule UnitPrice
from
Contract -> contractualProduct -> economicTerms -> payout -> securityPayout
-> securityValuation -> securityValuationModel -> bondValuationModel
-> bondPriceAndYieldModel -> cleanOrDirtyPrice -> dirtyPrice

Reporting Logic

STEP 1

Firm's Electronic Record of Transactions

This lives outside of the CDM

Subject: VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *

VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *

SETTLE DATE: 03/28/19	ISIN: DE0001102465	CUSIP: AW4161880
ROLL: N	SETTLEMENT	MARKET
PRICE	107.6179452	107.617945
MTY YLD	-0.4996321	-0.4996321
ACCRUED	0.0520548	0.0520548
PX+ACC	107.6700000	107.670000
# OF BONDS:	100000000	X
TERMINATION DT: 03/29/19	(1 days)	CALL OPTION: NO
MONEY AT TERMINATION:	WIRED AMOUNT:	107,670,000.00
{VCON <GO>} to Automate	REPO INTEREST:	-927.16
	TERMINATION MONEY:	107,669,072.84

Marketplace Message
(e.g. BBG VCON)

```
<repo>
  <fixedRateSchedule>
    <initialValue>-0.31</initialValue>
    <dayCountFraction>30/360</dayCountFraction>
    <duration>Term</duration>
    <initialMargin></initialMargin>
  </nearLeg>
  <buyerPartyReference href="Party1" />
  <sellerPartyReference href="Party2" />
  <settlementDate>
    <adjustableDate>2019-03-28</adjustableDate>
    <dateAdjustments></dateAdjustments>
  </settlementDate>
  <settlementAmount>
    <currency>EUR</currency>
    <amount>107670000.0</amount>
  </settlementAmount>
  <deliveryMethod>DeliveryVersusPayment</deliveryMethod>
  <collateral>
    <nominalAmount></nominalAmount>
    <cleanPrice>107.6179452</cleanPrice>
    <accruals>0.0520548</accruals>
    <dirtyPrice>107.67</dirtyPrice>
    <assetReference href="asset-ref-1" />
  </collateral>
</nearLeg>
<farLeg id="forwardLeg"></farLeg>
<bond id="asset-ref-1">
  <instrumentId
    instrumentIdScheme="http://www.fpml.org/coding-scheme
    instrumentId="DE0001102465
```

Firm's Electronic Record

=

Stereotype of how transactions get captured in
individual firms' systems

STEP 2

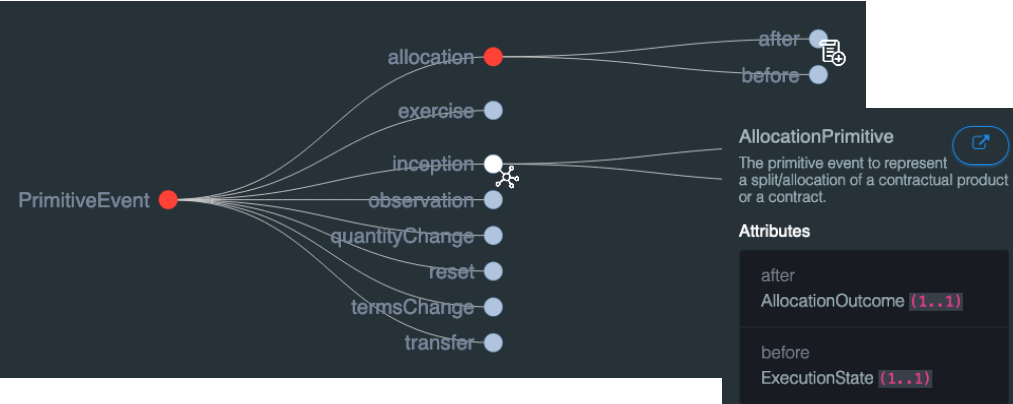
Normalise the Trade Event Model

Complete Map of Trading Scenarios

A	B	C	D	E	F	G	H	I	J	K	L
1	type	term	start	repo rate	venue	any special parties	event id	collateral	post-trade infrastructure	market name	
2	1.1	REPO	fixed	immediate	fixed	no	OTC	new	specific	ICSD	
3	1.1	REPO	fixed	immediate	fixed	no	OTC	new	specific	CSD direct participant	traditional OTC
4	2.2	REPO	fixed	immediate	fixed	no	OTC	branch	specific	custodian	
5	2.3	REPO	fixed	immediate	fixed	no	OTC	small NPIC	specific	custodian	
6	2.4	REPO	fixed	immediate	fixed	no	OTC	small NPIC	specific	ICSD	traditional brokered
7	2.5	REPO	fixed	immediate	fixed	no	OTC	agent	specific	custodian	agency
8	2.6	REPO	fixed	immediate	fixed	no	OTC	agent	specific	custodian	
9	2.7	REPO	fixed	immediate	floating	no	OTC	new	specific	ICSD	OTC floating rate
10	2.8	REPO	fixed	forward	fixed	no	OTC	new	specific	ICSD	forward
11	2.9	REPO	open	immediate	variable	no	OTC	new	specific	ICSD	OTC open
12	2.10	REPO	open	immediate	variable	no	OTC	new	specific	ICSD	OTC open
13	2.11	REPO	open	immediate	variable	no	OTC	agent	specific	ICSD	OTC open
14	2.12	REPO	open	immediate	variable	no	OTC	agent	specific	ICSD	OTC open
15	2.13	REPO	fixed	immediate	fixed	no	ATS	new	specific	ICSD	bilateral electronic
16	2.14	REPO	fixed	immediate	fixed	no	ATS	new	specific	ICSD	anonymous electronic
17	2.15	REPO	fixed	immediate	fixed	no	ATS	new	specific	ICSD	anonymous electronic
18	2.16	REPO	fixed	immediate	fixed	no	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
19	2.17	REPO	fixed	immediate	fixed	no	ATS	new (from prior repo)	specific	ICSD	anonymous electronic
20	3.1	REPO	fixed	immediate	fixed	no	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
21	3.2	REPO	fixed	immediate	fixed	no	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
22	3.3	REPO	fixed	immediate	fixed	no	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
23	4.1	REPO	open	immediate	variable	overgrown	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
24	4.2	REPO	open	immediate	variable	overgrown	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
25	4.3	REPO	open	immediate	variable	overgrown	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
26	4.4	REPO	open	immediate	variable	overgrown	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
27	5.1	REPO	fixed	immediate	fixed	no	OTC	new (from prior repo)	specific	ICSD	anonymous electronic
28	5.2	REPO	fixed	immediate	fixed	no	OTC	new (from prior repo)	specific	ICSD	anonymous electronic

DIGITISING THE EVENT MODEL

Most events are already in the CDM



Firm's Electronic Record

```
<repo>
<fixedRateSchedule>
  <initialValue>-0.31</initialValue>
</fixedRateSchedule>
<dayCountFraction>30/360</dayCountFraction>
<duration>Term</duration>
<initialMargin>=</initialMargin>
<nearLeg>
  <buyerPartyReference href="Party1" />
  <sellerPartyReference href="Party2" />
  <settlementDate>
    <adjustableDate>
      <unadjustedDate>2019-03-28</unadjustedDate>
      <dateAdjustments>=</dateAdjustments>
    </adjustableDate>
  </settlementDate>
  <settlementAmount>
    <currency>EUR</currency>
    <amount>107670000.0</amount>
  </settlementAmount>
  <deliveryMethod>DeliveryVersusPayment</deliveryMethod>
  <collateral>
    <nominalAmount>=</nominalAmount>
    <cleanPrice>107.6179452</cleanPrice>
    <accruals>0.0520548</accruals>
    <dirtyPrice>107.67</dirtyPrice>
    <assetReference href="asset-ref-1" />
  </collateral>
</nearLeg>
<farLeg id="forwardLeg">=</farLeg>
<bond id="asset-ref-1">
  <instrumentId
    instrumentIdScheme="http://www.fpml.org/coding-scheme
      /external/instrument-id-ISIN-1-0">DE0001102465
```

CDM INGESTION

Example: New Trade = "Inception" Event

```
"action": "NEW",
"eventDate": "2019-03-27",
"eventEffect": {<=>},
"eventIdentifier": {<=>},
"eventQualifier": "NewTrade",
"meta": {<=>},
"party": {<=>},
"primitive": {
  "inception": [
    {
      "after": {
        "contract": {
          "contractIdentifier": {<=>},
          "contractualProduct": {
            "economicTerms": {
              "payout": {
                "interestRatePayout": {<=>},
                "securityPayout": [
                  {
                    "initialMargin": {<=>},
                    "meta": {<=>},
                    "nonDuration": "TERM",
                    "securityLeg": [
                      {<=>},
                      {<=>},
                      {<=>},
                    ],
                    "securityValuation": {<=>},
                  },
                ],
              },
            },
          "rosettaKeyValue": "8f3ac8a3"
        },
      },
      "productIdentification": {
        "productQualifier": "RepurchaseAgreement"
      }
    }
  ],
}
```

Inferred qualification of product and event

Economic Terms: 1 interest rate payout + 2 security legs = "Repo"

STEP 3 – SFTR APPLICATION

Drive Reporting from the Trade Event Model

Reporting Sample per Scenario

DIGITISING THE REPORTING LOGIC



```
report ESMA_SFTR regulation "(EU) 2015/2365" in T+1 when InScopeOfEvent
using standard ISO_20022 with fields
TypeOfSFT
UnitPrice
```

```
reporting rule TypeOfSFT
from
if ProductIdentification -> productType = "RepurchaseAgreement"
then "REPO"
else if ProductIdentification -> productType = "Buy_Sell_Back"
then "SBSC"
else ""
```

```
reporting rule UnitPrice
from
Contract -> contractualProduct -> economicTerms -> payout -> securityPayout
-> securityValuation -> securityValuationModel -> bondValuationModel
-> bondPriceAndYieldModel -> cleanOrDirtyPrice -> dirtyPrice
```

```
"action": "NEW",
"eventDate": "2019-03-27",
"eventEffect": {},
"eventIdentification": {},
"eventQualifier": "NewTrade",
"party": {},
"primitive": {},
"inception": [
  "after": {
    "contract": {
      "contractIdentifier": {},
      "contractualProduct": {
        "economicTerms": {
          "payout": {
            "interestRatePayout": {},
            "securityPayout": [
              {
                "initialMargin": {},
                "meta": {},
                "repoDuration": "TERM",
                "securityLeg": [
                  {},
                  {}
                ],
                "securityValuation": {}
              }
            ],
            "rosettaKeyValue": "8f3ac8a3"
          },
          "productIdentification": {
            "productQualifier": "RepurchaseAgreement"
```

```
"securityPayout": [
  {
    "initialMargin": {},
    "meta": {},
    "repoDuration": "TERM",
    "securityLeg": [
      {},
      {}
    ],
    "securityValuation": [
      {
        "securityValuationModel": {
          "bondValuationModel": {
            "bondPriceAndYieldModel": {
              "cleanOrDirtyPrice": {
                "cleanPrice": {
                  "accruals": 0.0520548,
                  "cleanPrice": 107.6179452
                },
                "dirtyPrice": 107.67
```

PROJECTION



```
<ns0:TxId>ABC1000244</ns0:TxId>
<ns0:ExctgPty>10G7TPQLTCT5J1I9FLFVA</ns0:ExctgPty>
<ns0:InvstmtPtyInd>true</ns0:InvstmtPtyInd>
<ns0:SubmitgPty>10G7TPQLTCT5J1I9FLFVA</ns0:SubmitgPty>
<ns0:Buyr></ns0:Buyr>
<ns0:Sellr></ns0:Sellr>
<ns0:TrnsmssnInd>false</ns0:TrnsmssnInd>
</ns0:OrderTrnsmssn>
<ns0:Tx>
  <ns0:TradDt>2019-03-27</ns0:TradDt>
  <ns0:TradCpty>DEAL</ns0:TradCpty>
  <ns0:Pri>107.67</ns0:Pri>
  <ns0:CtryOfBrnch>UK</ns0:CtryOfBrnch>
</ns0:Tx>
<ns0:FinInstrm>
  <ns0:Othr>
    <ns0:FinInstrmGnlAttrbts>
      <ns0:Classfctn>REPO</ns0:Classfctn>
      <ns0:NtlCcy>EUR</ns0:NtlCcy>
    </ns0:FinInstrmGnlAttrbts>
    <ns0:DerivInstrmAttrbts></ns0:DerivInstrmAttrbts>
  </ns0:Othr>
</ns0:FinInstrm>
<ns0:InvstmtDcsnPrsn></ns0:InvstmtDcsnPrsn>
<ns0:ExctgPrsn></ns0:ExctgPrsn>
<ns0:AddtlAttrbts></ns0:AddtlAttrbts>
</ns0:New>
```

Reportable price(s) fetched from the model

Type of SFT uses built-in product qualification

PIECING IT ALL BACK TOGETHER

A Common Base Providing Inter-Operable Implementations

Subject: VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *

VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *
SETTLE DATE: 03/28/19 ISIN: DE0001102465 CUSIP: AW4161880
ROLL: N SETTLEMENT MARKET TENOR: SPREAD: 0.0000
PRICE 107.6179452 107.617945 FIXED RATE(360): -0.3100%
MTY YLD -0.4996321 -0.4996321 COLLATERAL: 100.00% of money
ACCRUED 0.0520548 0.0520548 AS OF: 03/27/19 09:51
PX+ACC 107.6700000 107.6700000
OF BONDS: 100000000 X SETTLE MONEY 107670000.00
TERMINATION DT: 03/29/19 (1 days) CALL OPTION: NO
MONEY AT TERMINATION: WIRED AMOUNT: 107,670,000.00
{VCON <GO>} to Automate REPO INTEREST: -927.16
TERMINATION MONEY: 107,669,072.84

Marketplace Message
(e.g. BBG VCON)

```
<repo>  
<fixedRateSchedule>  
  <initialValue>-0.31</initialValue>  
</fixedRateSchedule>  
<dayCountFractions>30/360</dayCountFractions>  
<duration>Term</duration>  
<initialMargin></initialMargin>  
<nearLeg>  
  <buyerPartyReference href="Party1" />  
  <sellerPartyReference href="Party2" />  
  <settlementDate>  
    <adjustableDate></adjustableDate>  
  </settlementDate>  
  <settlementAmount>  
    <currency>EUR</currency>  
    <amount>107670000.0</amount>  
  </settlementAmount>  
  <deliveryMethod>DeliveryVersusPayment</deliveryMethod>  
  <collateral>  
    <nominalAmount></nominalAmount>  
    <cleanPrice>107.6179452</cleanPrice>  
    <accruals>0.0520548</accruals>  
    <dirtyPrice>107.67</dirtyPrice>  
    <assetReference href="asset-ref-1" />  
  </collateral>  
</nearLeg>  
<farLeg id="forwardLeg"></farLeg>  
<bond id="asset-ref-1">
```

Firm's Electronic Record

One CDM-based implementation
(they are all inter-operable)

```
{  
  "contractualProduct": {  
    "economicTerms": {  
      "payout": {  
        "interestRatePayout": [{}],  
        "securityPayout": [  
          {  
            "initialMargin": {},  
            "meta": {},  
            "repoDuration": "TERM",  
            "securityLeg": [  
              {},  
              {}  
            ],  
            "securityValuation": [{}]  
          }  
        ],  
        "rosettaKeyValue": "8f3ac8a3"  
      },  
      "productIdentification": {  
        "productQualifier": "RepurchaseAgreement"  
      }  
    }  
  },  
  "report": {  
    "ESMA_SFTR": {  
      "regulation": "(EU) 2015/2365",  
      "inScopeOfEvent": true,  
      "unitPrice": {}  
    }  
  }  
}
```

Normalised Trade Event

```
<ns0:New>  
<ns0:TxId>ABC1000244</ns0:TxId>  
<ns0:ExctgPty>10677PQLTCSJ119FLFVA</ns0:ExctgPty>  
<ns0:InvstmtPtyInd>true</ns0:InvstmtPtyInd>  
<ns0:SubmitgPty>10677PQLTCSJ119FLFVA</ns0:SubmitgPty>  
<ns0:Buyr></ns0:Buyr>  
<ns0:Sellr></ns0:Sellr>  
<ns0:OrdTrnsmssn>  
  <ns0:TrnsmssnInd>false</ns0:TrnsmssnInd>  
</ns0:OrdTrnsmssn>  
<ns0:Tx>  
  <ns0:TradDt>2019-03-27</ns0:TradDt>  
  <ns0:TradgPcty>DEAL</ns0:TradgPcty>  
  <ns0:Prcl>107.67</ns0:Prcl>  
  <ns0:CtryOfBrnch>UK</ns0:CtryOfBrnch>  
</ns0:Tx>  
<ns0:FinInstrm>  
  <ns0:Othr>  
    <ns0:FinInstrmGnlAttrbts>  
      <ns0:ClassfctnTp>REPO</ns0:ClassfctnTp>  
      <ns0:NtlCcy>EUR</ns0:NtlCcy>  
    </ns0:FinInstrmGnlAttrbts>  
    <ns0:DerivInstrmAttrbts></ns0:DerivInstrmAttrbts>  
  </ns0:Othr>  
</ns0:FinInstrm>  
<ns0:InvstmtDscnPrsn></ns0:InvstmtDscnPrsn>  
<ns0:ExctgPrsn></ns0:ExctgPrsn>  
<ns0:AddtlAttrbts></ns0:AddtlAttrbts>  
</ns0:New>  
</ns0:Tx>
```

SFTR Report
Extract
(ISO 20022)

report ESMA_SFTR regulation "(EU) 2015/2365" in T+1 when InScopeOfEvent
using standard ISO_20022 with fields
TypeOfSFT
UnitPrice

reporting rule TypeOfSFT
from
if ProductIdentification -> productType = "RepurchaseAgreement"
then "REPO"
else if ProductIdentification -> productType = "Buy_Sell_Back"
then "SBSC"
else ""

reporting rule UnitPrice
from
Contract -> contractualProduct -> economicTerms -> payout -> securityPayout
-> securityValuation -> securityValuationModel -> bondValuationModel
-> bondPriceAndYieldModel -> cleanOrDirtyPrice -> dirtyPrice

Reporting Logic

POTENTIAL FUTURE STATE – 1

CDM-Based Messaging and Recording Across the Marketplace

Subject: VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *

VCON * RP - DEALER LENDS COLL.:	DBR 0 ¼ 02/15/29 Corp	*
SETTLE DATE:	03/28/19	ISIN: DE0001102465 CUSIP: AW4161880
ROLL: N	SETTLEMENT	MARKET TENOR: SPREAD: 0.0000
PRICE	107.6179452	107.617945 FIXED RATE(360): -0.3100%
MTY YLD	-0.4996321	-0.4996321 COLLATERAL: 100.00% of money
ACCURED	0.0520548	0.0520548 AS OF: 03/27/19 09:51
PX+ACC	107.6700000	107.670000
# OF BONDS:	100000000	X SETTLE MONEY 107670000.00
TERMINATION DT:	03/29/19	(1 days) CALL OPTION: NO
MONEY AT TERMINATION:	WIRED AMOUNT:	107,670,000.00
{VCON <GO>} to Automate	REPO INTEREST:	-927.16
	TERMINATION MONEY:	107,669,072.84

Marketplace Message
(e.g. BBG VCON)

```
<repo>
<fixedRateSchedule>
  <initialValue>-0.31</initialValue>
</FixedRateSchedule>
<dayCountFractions>30/360</dayCountFractions>
<duration>Term</duration>
<initialMargin>
</nearLeg>
  <buyerPartyReference href="Party1" />
  <sellerPartyReference href="Party2" />
  <settlementDate>
    <adjustableDate>
</adjustableDate>
  </settlementDate>
  <settlementAmount>
    <currency>EUR</currency>
    <amount>107670000.0</amount>
  </settlementAmount>
  <deliveryMethod>DeliveryVersusPayment</deliveryMethod>
  <collateral>
    <nominalAmount>
</nominalAmount>
    <cleanPrice>107.6179452</cleanPrice>
    <accruals>0.0520548</accruals>
    <dirtyPrice>107.67</dirtyPrice>
    <assetReference href="asset-ref-1" />
  </collateral>
</nearLeg>
<farLeg id="forwardLeg">
</farLeg>
<bond id="asset-ref-1">
```

Firm's Electronic Record

All merged into one
=
CDM representation

```
"contractualProduct": {
  "economicTerms": {
    "payout": {
      "interestRatePayout": [
],
      "securityPayout": [
        {
          "initialMargin": [
],
          "meta": {
],
          "repoDuration": "TERM",
          "securityLeg": [
            [
],
],
          "securityValuation": [
]
        }
      ],
    },
    "rosettaKeyValue": "8f3ac8a3"
  },
  "productIdentification": {
    "productQualifier": "RepurchaseAgreement"
  }
},
},
```

Normalised Trade Event

```
<ns0:New>
  <ns0:TxId>ABC1000244</ns0:TxId>
  <ns0:ExctgPty>10677PQLTCSJ119FLFVA</ns0:ExctgPty>
  <ns0:InvstmtPtyInd>true</ns0:InvstmtPtyInd>
  <ns0:SubmitgPty>10677PQLTCSJ119FLFVA</ns0:SubmitgPty>
  <ns0:Buyr>
  </ns0:Buyr>
  <ns0:Sellr>
  </ns0:Sellr>
  <ns0:OrdTrnsmssn>
    <ns0:TrnsmssnInd>false</ns0:TrnsmssnInd>
  </ns0:OrdTrnsmssn>
  <ns0:Tx>
    <ns0:TradDt>2019-03-27</ns0:TradDt>
    <ns0:TradgPcty>DEAL</ns0:TradgPcty>
    <ns0:Pri>107.67</ns0:Pri>
    <ns0:CtryOfBrnch>UK</ns0:CtryOfBrnch>
  </ns0:Tx>
  <ns0:FinInstrm>
    <ns0:Othr>
      <ns0:FinInstrmGnlAttrbts>
        <ns0:ClassfctnTp>REPO</ns0:ClassfctnTp>
        <ns0:NtlCcy>EUR</ns0:NtlCcy>
      </ns0:FinInstrmGnlAttrbts>
      <ns0:DerivInstrmAttrbts>
      </ns0:DerivInstrmAttrbts>
    </ns0:Othr>
  </ns0:FinInstrm>
  <ns0:InvstmtDcsnPrsn>
  </ns0:InvstmtDcsnPrsn>
  <ns0:ExctgPrsn>
  </ns0:ExctgPrsn>
  <ns0:AddtlAttrbts>
  </ns0:AddtlAttrbts>
</ns0:New>
```

SFTR Report
Extract
(ISO 20022)

report ESMA_SFTR regulation "(EU) 2015/2365" in T+1 when InScopeOfEvent
using standard ISO_20022 with fields
TypeOfSFT
UnitPrice

reporting rule TypeOfSFT
from
if ProductIdentification -> productType = "RepurchaseAgreement"
then "REPO"
else if ProductIdentification -> productType = "Buy_Sell_Back"
then "SBSC"
else ""

reporting rule UnitPrice
from
Contract -> contractualProduct -> economicTerms -> payout -> securityPayout
-> securityValuation -> securityValuationModel -> bondValuationModel
-> bondPriceAndYieldModel -> cleanOrDirtyPrice -> dirtyPrice

Reporting Logic

POTENTIAL FUTURE STATE – 2

“Digital Regulatory Reporting” = DRR

Subject: VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *

VCON * RP - DEALER LENDS COLL.: DBR 0 ¼ 02/15/29 Corp *
SETTLE DATE: 03/28/19 ISIN: DE0001102465 CUSIP: AW4161880
ROLL: N SETTLEMENT MARKET TENOR: SPREAD: 0.0000
PRICE 107.6179452 107.617945 FIXED RATE(360): -0.3100%
MTY YLD -0.4996321 -0.4996321 COLLATERAL: 100.00% of money
ACCRUED 0.0520548 0.0520548 AS OF: 03/27/19 09:51
PX+ACC 107.6700000 107.6700000
OF BONDS: 100000000 X SETTLE MONEY 107670000.00
TERMINATION DT: 03/29/19 (1 days) CALL OPTION: NO
MONEY AT TERMINATION: WIRED AMOUNT: 107,670,000.00
{VCON <GO>} to Automate REPO INTEREST: -927.16
TERMINATION MONEY: 107,669,072.84

Marketplace Message
(e.g. BBG VCON)

```
<repo>  
<fixedRateSchedule>  
  <initialValue>-0.31</initialValue>  
</fixedRateSchedule>  
<dayCountFractions>30/360</dayCountFractions>  
<duration>Term</duration>  
<initialMargin></initialMargin>  
<nearLeg>  
  <buyerPartyReference href="Party1" />  
  <sellerPartyReference href="Party2" />  
  <settlementDate>  
    <adjustableDate></adjustableDate>  
  </settlementDate>  
  <settlementAmount>  
    <currency>EUR</currency>  
    <amount>107670000.0</amount>  
  </settlementAmount>  
  <deliveryMethod>DeliveryVersusPayment</deliveryMethod>  
  <collateral>  
    <nominalAmount></nominalAmount>  
    <cleanPrice>107.6179452</cleanPrice>  
    <accruals>0.0520548</accruals>  
    <dirtyPrice>107.67</dirtyPrice>  
    <assetReference href="asset-ref-1" />  
  </collateral>  
</nearLeg>  
<farLeg id="forwardLeg"></farLeg>  
<bond id="asset-ref-1">
```

Firm’s Electronic Record



Reporting pulled by
regulators “on-demand”
(building CDM logic)

```
"contractualProduct": {  
  "economicTerms": {  
    "payout": {  
      "interestRatePayout": [{}],  
      "securityPayout": [  
        {  
          "initialMargin": [{}],  
          "meta": {[]},  
          "repoDuration": "TERM",  
          "securityLeg": [  
            {[]},  
            {[]}  
          ],  
          "securityValuation": [{}]  
        }  
      ],  
      "rosettaKeyValue": "8f3ac8a3"  
    },  
    "productIdentification": {  
      "productQualifier": "RepurchaseAgreement"  
    }  
  }  
},
```

Normalised Trade Event

```
<ns0:New>  
<ns0:TxId>ABC1000244</ns0:TxId>  
<ns0:ExctgPty>10677PQLTCSJ119FLFVA</ns0:ExctgPty>  
<ns0:InvstmtPtyInd>true</ns0:InvstmtPtyInd>  
<ns0:SubmitgPty>10677PQLTCSJ119FLFVA</ns0:SubmitgPty>  
<ns0:Buy></ns0:Buy>  
<ns0:Sell></ns0:Sell>  
<ns0:OrdTrnsmssn>  
  <ns0:TrnsmssnInd>false</ns0:TrnsmssnInd>  
</ns0:OrdTrnsmssn>  
<ns0:Tx>  
  <ns0:TradDt>2019-03-27</ns0:TradDt>  
  <ns0:TradgPcty>DEAL</ns0:TradgPcty>  
  <ns0:Pr>107.67</ns0:Pr>  
  <ns0:CtryOfBrnch>UK</ns0:CtryOfBrnch>  
</ns0:Tx>  
<ns0:FinInstrm>  
  <ns0:Othr>  
    <ns0:FinInstrmGnlAttrbts>  
      <ns0:ClassfctnTp>REPO</ns0:ClassfctnTp>  
      <ns0:NtlCcy>EUR</ns0:NtlCcy>  
    </ns0:FinInstrmGnlAttrbts>  
    <ns0:DerivInstrmAttrbts></ns0:DerivInstrmAttrbts>  
  </ns0:Othr>  
</ns0:FinInstrm>  
<ns0:InvstmtDcsnPrsn></ns0:InvstmtDcsnPrsn>  
<ns0:ExctgPrsn></ns0:ExctgPrsn>  
<ns0:AddtlAttrbts></ns0:AddtlAttrbts>  
</ns0:New>  
</ns0:Tx>
```

SFTR Report
Extract
(ISO 20022)

report ESMA_SFTR regulation "(EU) 2015/2365" in T+1 when InScopeOfEvent
using standard ISO_20022 with fields
TypeOfSFT
UnitPrice

reporting rule TypeOfSFT
from
if ProductIdentification -> productType = "RepurchaseAgreement"
then "REPO"
else if ProductIdentification -> productType = "Buy_Sell_Back"
then "SBSC"
else ""

reporting rule UnitPrice
from
Contract -> contractualProduct -> economicTerms -> payout -> securityPayout
-> securityValuation -> securityValuationModel -> bondValuationModel
-> bondPriceAndYieldModel -> cleanOrDirtyPrice -> dirtyPrice

Reporting Logic

What is required to initiate the project

- Focus on use-case to drive delivery of CDM extension for repo:
 - SFTR?
 - Other: Collateral Management?

- Identify some key firm(s) from your membership who will agree to:
 - Provide sample legal agreements (GMRA, trade confirmations)
 - Provide sample electronic records of trades and/or database schemas (from their trading / booking systems) – to be used as inputs to enhance the CDM event model and also as testing data
 - Commit to test the CDM extension on the selected use case