

Airbrush

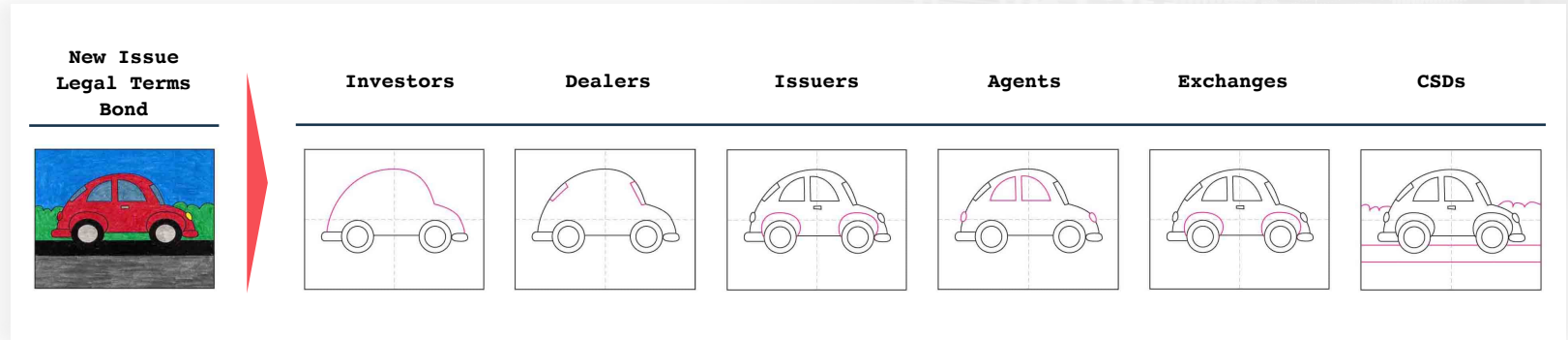
A common specification for the creation and definition of new fixed income securities

OCTOBER 2021

The Data Problem

The same security “exists” in multiple systems, **defined in different ways**

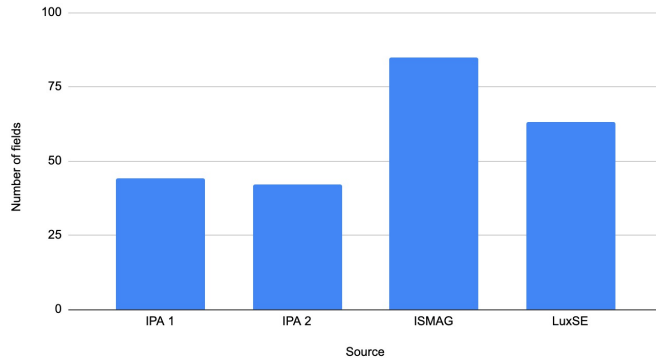
When a new bond is created, each institution creates a representation of that bond in their systems. But the way they define it can differ from system to system.



Two major challenges to a standard definition of a bond

1 How many fields do you need to define the bond?

Field requirements by source*

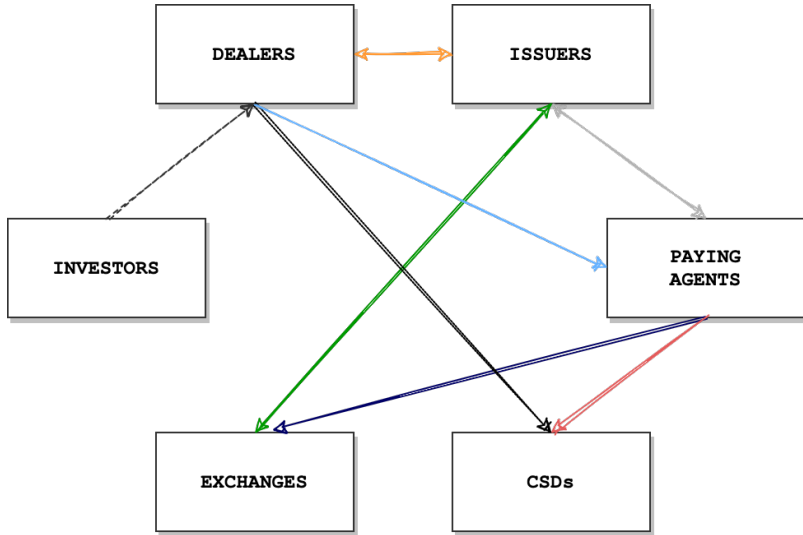


2 What should you call each field and list of acceptable values?

| IPA 1 | IPA 2 | LuxSE | Clearstream | Airbrush |
|---------------------------------|--------------------|-----------------------|-----------------------------------|--------------------------------------|
| CCY | Currency | specified Currency | Nominal Currency | currency.nominal (mandatory) |
| Income CCY (if different) | Coupon Currency | | Payment Currency | currency.payment (conditional) |
| Maturity CCY | | | Redemption Payment Currency | |
| Settlement CCY | | | | currency.settlement (conditional) |

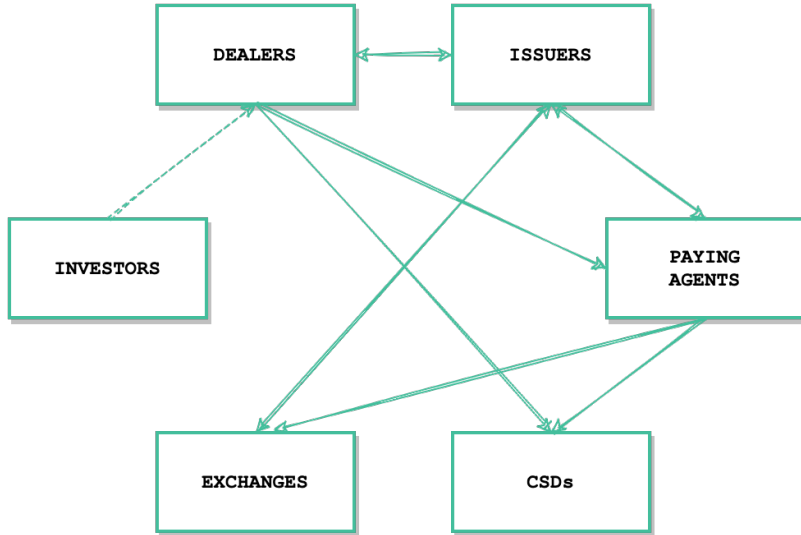
Airbrush solves both problems. For each type of security, we specify the necessary and sufficient parameters to define it and propose a naming convention for fields and values.

**Note: data has been adjusted to enable like-for-like scope comparison between sources*



“Straight-through-processing” is difficult to achieve with bespoke integrations between different counterparties

Each integration requires a bespoke mapping from **System A** to **System B**



Requiring the entire ecosystem to re-architect their systems to a new standard will take years to implement

The “**holy grail**” solution may be a common database standard that everyone adheres to, or even a “ledger” that everyone “shares”.

But re-architecting the internal systems of every market participant will take years, (maybe decades), before there will be any tangible benefit.

Standardisation can be achieved at different levels



Document

Method:

Use the same form of documents and same terminology within documents.

Trade-offs:

Issuers (and lawyers) would lose flexibility in future issuances.



Database

Method:

Every infrastructure institution re-architects their database to adhere to a common specification.

Trade-offs:

Would take years / be prohibitively expensive as institutions have different legacy systems.



Interface

Method:

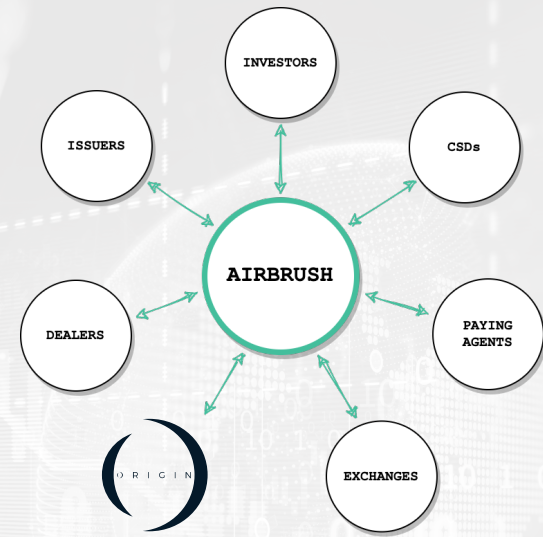
Institutions agree on a common specification for communicating transaction data to one another. Similar to the USB standard for consumer electronics.



Airbrush is an interface data standard for defining a new fixed income security

Think of Airbrush like the “USB” interface for the capital markets. Users can maintain their own internal data models, and technology platforms can use whatever markup languages they want for document automation. Airbrush is a taxonomy, that allows systems to communicate with each other, by defining:

- **Minimum set of defined field names** to process a new issuance
- **Conditionality** for when those fields are required
- **Data types** for each field
- **Valid values / options** for each potential value of that field (where relevant)

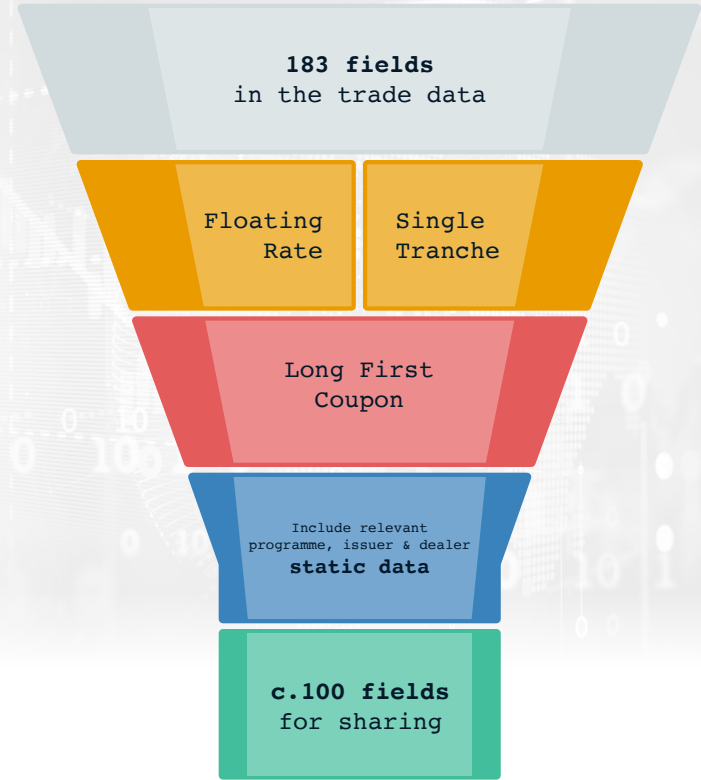


| Category | Field Name | Type | Enumeration |
|----------|-----------------------------------|-------------|---|
| form | form.after_exchange_physical_form | enumeration | [- Permanent Global Note - Definitive Notes] |
| form | form.global_note_required | boolean | [True, False] |
| form | form.global_note_type | enumeration | [- Classic Global Note - New Global Note - New Safekeeping Structure] |
| form | form.initial_physical_form | enumeration | [- Temporary Global Note - Permanent Global Note - Definitive Notes] |

Airbrush filters transaction data to ensure we agree on what is a necessary and sufficient data set for each trade

A recent test trade on the Origin platform generated 183 fields representing the trade. Data needs to be cleaned before it can be shared, and then augmented with certain programme/issuer/dealer static data – Airbrush is the standard we will use to do this.

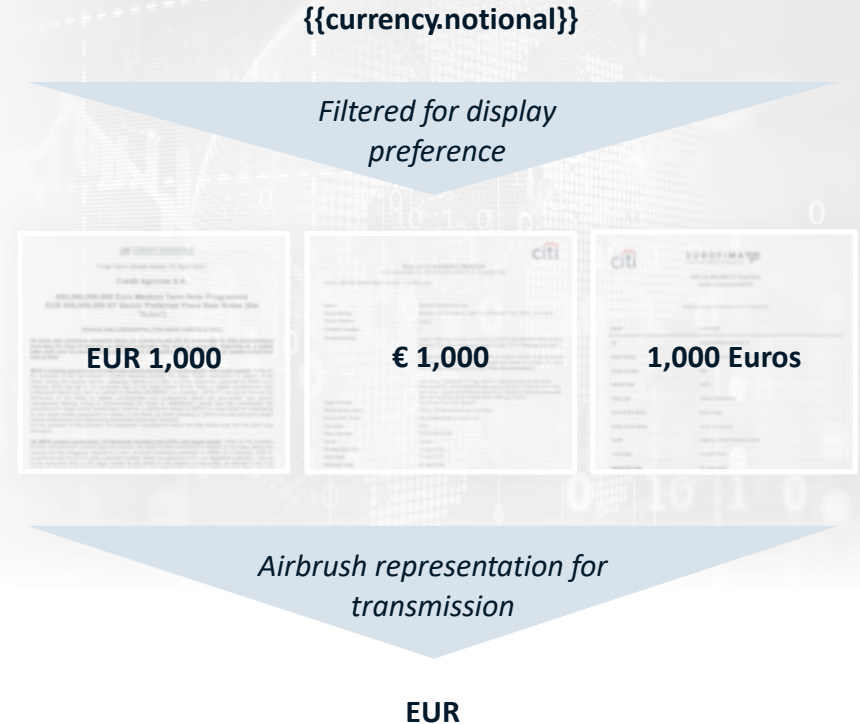
It is modular, so we can select the fields which need to be shared based on the attributes of the trade.



Separating the 'storage' and 'display' layers

The machine-readable termsheet is designed with data storage and transmission in mind. The guiding principle of the termsheet (and Airbrush) is to standardise the mutually exclusive and collectively exhaustive minimum set of data required to define, document and process the issue.

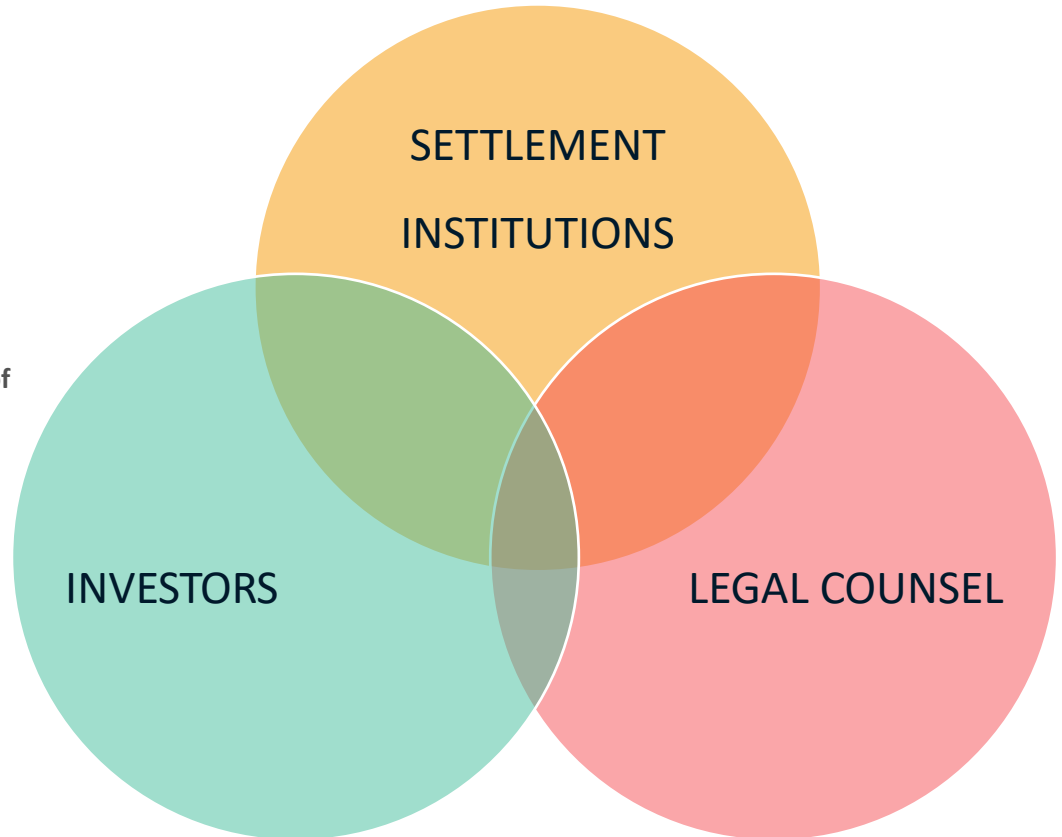
The **display** of data is defined by the involved parties' preferences. For example, 'EUR', '€' or 'Euros' are all properties of **{{currency.notional}}** rather than being defined as separate data. On Origin's platform, these display preferences are handled through the code and extensions to Jinja, meaning that the dictionary of common fields can be standardized for storage and processing while the display of the data in the documentation is flexible.



Termsheet data requirements

The Airbrush Standardised Termsheet has been refined based on over 100 live and test trades conducted with over 30 issuers since the start of 2020.

Crucially, the termsheet **reflects the requirements of all the stakeholders** in a transaction, including the parties to the trade (issuers/dealers/investors), but importantly the infrastructure institutions that are involved in settlement.



Standardised Termsheet template

It currently supports:

Seniority: Senior Preferred and Senior Unsecured

Coupon type: fixed, floating and zero coupon

Distribution: Private placement and benchmark /syndicated

Format: MTN issuance under a programme

[Indicative / Final] Termsheet dated []

[Issuer name(s)]
[Specify the programme]
 [Description of the Notes/Bonds]

| | |
|---|--|
| Issuer(s) | [] (LEI: []) |
| Issuer Rating | [] |
| [Guarantor] | [] ¹ |
| [Guarantor Rating] | [] ² |
| [Product Rating] | [] ³ |
| [Expected Issue Rating] | [] ⁴ |
| Currency | [] [payable in [specify currency]] ⁵ |
| Series Number | [] |
| Issuance Type | [MTN/CD/CP/Specify other] |
| Form of the Notes | [Bearer/Registered/Specify other] [3 (c) 7/Reg S/144A/RLS] |
| [Note Type] | [Classical Global Note/New Global Note/New Safekeeping Structure] ⁶ |
| [ECB Eligible] | [Yes / No] ⁷ |
| Status of the Notes | [Senior Unsecured/Senior Preferred/Senior Non Preferred/Specify] ⁸ |
| [Tranche]⁹ Nominal Amount | [] |
| [Series Nominal Amount] | [] ([] on the existing []) ¹⁰ |
| Specified Denominations | [] [x []] ¹¹ |

Standardised Termsheet template

The Standardised Termsheet provides the logic for completing the template in the manner of a 'Form of Final Terms' template, using square brackets and footnotes to provide direction to the user.

The options for each field are provided where appropriate and practicable and correspond to the options for those fields in Airbrush.

[Payment Delay:] [The first/[]] [London/US Government Securities/TARGET2/specify] [Banking/Business] Day[s] [of each/prior to the start of the next] Interest Period taken from [Reuters/Bloomberg/specify] page [].

| | |
|--------------------------|-----------------------------------|
| Interest Fixing | |
| [Benchmark] | [] |
| Benchmark Price | [] |
| [Benchmark Yield] | [] ²² / ²³ |
| [Mid-swap Yield] | [] ²⁴ |

[Payment Delay:] [The first/[]] [London/US Government Securities/TARGET2/specify] [Banking/Business] Day[s] [of each/prior to the start of the next] Interest Period taken from [Reuters/Bloomberg/specify] page [].

¹³ If the notes/bonds to be issued have a call option, include this statement.
¹⁴ If fallback provisions are required, include this statement.
¹⁵ Insert this clause if a broken amount is required.
¹⁶ If fallback provisions are required, include this statement.
¹⁷ Include if further details on the reference rate have been inserted in the annex.
¹⁸ Include if the benchmark rate is an Overnight Rate.
¹⁹ Include if the benchmark rate is an Overnight Rate and the Determination Method is not Index Determination.
²⁰ Include if a coupon cap is required.
²¹ Include for Notes other than Floating Rate Notes.
²² Include if a benchmark reference is required for pricing purposes.
²³ Include if a Mid-Swap Rate is required for pricing purposes.

¹³ If the notes/bonds to be issued have a call option, include this statement.
¹⁴ If fallback provisions are required, include this statement.
¹⁵ Insert this clause if a broken amount is required.
¹⁶ If fallback provisions are required, include this statement.
¹⁷ Include if further details on the reference rate have been inserted in the annex.
¹⁸ Include if the benchmark rate is an Overnight Rate.

Machine-Readable Termsheet

The Machine-Readable Termsheet transforms the logic in the Standardised Termsheet into code.

While the **data specification** is Airbrush, the **language** used in the template is Jinja – an open-source templating language based on Python. Many of these templating languages already exist and we selected an open-source and well-established language to allow maximum market utility.

Any interested user can download a Jinja ‘parser’ (the engine which reads the data and inserts it throughout the template) and use this Machine-Readable Termsheet ‘out of the box’.

```

Term Sheet dated {{trade_date}}
{% for issuer in issuers %}{{issuer.name}}{% if loop.revindex0 == 1%} and {%else%}{%if loop.last == False
%, {%endif%}{%endif%}{%endif%}{% endfor%}
    {{programme.type}}
    {{currency.notional}} {{size}}{% if is_fungible==True%} Tap of {{currency.notional}}
    {{fungible.original_size}} {%if interest.type=="Fixed Rate"%}{{interest.fixed_rate}}{%endif%}
    {{status_of_the_notes}} {{interest.type}} {%else%}{% if redemption.type ==
"Call"%}{{redemption.callable_structure}}{%endif%}{% if issuance_category=="Social Bonds"%}Social
    {%elif issuance_category=="Green Bonds"%}Green {%elif issuance_category=="Sustainable
    Bonds"%}Sustainable {%endif%} {{status_of_the_notes}} {%if interest.type=="Fixed
    Rate"%}{{interest.fixed_rate}}{%endif%}{{interest.type}}{%endif%} Notes due
    {{redemption.maturity_date}} (the "Notes"{% if currency.settlement is defined %}
    payable in {{currency.settlement}}){%endif%}

```

| | |
|-------------------------|---|
| Issuer | {% for issuer in issuers %}{{issuer.name}} (LEI: {{issuer.lei}}){% if loop.revindex0 == 1%} and {%else%}{%if loop.last == False %, {%endif%}{%endif%}{%endif%}{%endif%}{% endfor%} |
| Issuer Rating | {% for issuer in issuers %}{{issuer.name}}: {% for rating in issuer.ratings %}{{(rating.agency)}: {{(rating.value)}} {{(rating.outlook)}}{% if loop.revindex0 == 1%} and {%else%}{%if loop.last == False %, {%endif%}{%endif%}{%endif%}{%endif%}{% if loop.revindex0 == 1%} {%else%}{%if loop.last == False %} {%endif%}{%endif%}{%endif%}{%endif%}{% if guarantors is defined %} {%endif%}{%endif%}{%endif%}{%endif%}{% endfor%} |
| Guarantor | {% for guarantor in guarantors %}{{guarantor.name}} {% if guarantor.lei is defined %} (LEI: {{guarantor.lei}}){%endif%}{% if loop.revindex0 == 1%} and {%else%}{%if loop.last == False %, {%endif%}{%endif%}{%endif%}{%endif%}{%endif%}{% endfor%} |
| Guarantor Rating | {% for guarantor in guarantors %}{{guarantor.name}} {% for rating in guarantor.ratings %}{{(rating.agency)}: {{(rating.value)}} {{(rating.outlook)}} {%endif%} {%endif%}{%endif%}{%endif%}{% if rating_type == "Product" %} {%endif%}{%endif%}{%endif%}{%endif%}{% endfor%} |
| Product Rating | {% for rating in ratings %}{{(rating.agency)}: {{(rating.value)}} {{(rating.outlook)}} {%endif%}{%endif%}{%endif%}{%endif%}{% if rating_type == "Issue"%} {%endif%}{%endif%}{%endif%}{%endif%}{% endfor%} |

Machine-Readable Termsheet template

In the Airbrush GitHub repository you will find:

- The Machine Readable termsheet
- An example JSON file of structured data in the Airbrush format
- Instructions on how to download and install an open source basic 'parser' which enables you to use the Machine Readable Termsheet to turn JSON files into Termsheets

Interested users can download this information from the GitHub repository and use it to see how Airbrush can be used for the production of legal documentation.

```

{
  "agents": {
    "issuing_and_paying_agent": {
      "name": "Citibank N.A., London Branch"
    }
  },
  "clearing": {
    "clearing_system": "Euroclear/Clearstream"
  },
  "currency": {
    "notional": "BRL",
    "settlement": "USD"
  },
  "dealers": [
    {
      "name": "CAIB",
      "country": "UK",
      "role": "Lead Manager"
    }
  ],
}
    
```

Term Sheet dated 2021-06-17

Vasakronan AB (Publ)
EMTN

USD 50,000,000 Senior Unsecured Floating Rate Notes due 25th June 2021 (the "Notes")
payable in BRL

| | |
|----------------------|---|
| Issuer | Vasakronan AB (Publ) (LEI: 5493007LNZ5EWN5KTV42) |
| Issuer Rating | Vasakronan AB (Publ): Moody's: Aa1 (stable) and Fitch: A (stable) |

Airbrush was constructed by aligning requirements of multiple market participants

Origin developed **Airbrush** by mapping our transaction and programme data to align with the requirements of Clearstream, LuxSE, the ISO standards and major paying agents



Airbrush v3.0 – Future plans

During the next 12 months, we aim to expand the coverage of the Airbrush data set to more use cases within the issuance workflow:

- SSIs and other settlement-related fields
- More detailed support for the asset servicing / lifecycle data requirements

We would welcome feedback on any specific areas which market participants would like to see incorporated in the next iteration.

airbrush@originmarkets.com

Where do I find out more?



The Airbrush data specification is published using the OpenAPI specification onto Origin's Github repository. Get access at <https://originmarkets.com/airbrush>

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