

## <Supplemental material>

### Manuscript title: Blockchain-based multi-regional input-output (MRIO) framework for carbon accounting in global supply chains

```
[vm] from: 0x5B3...eddC4 to: Registration.(constructor) value: 0 wei data: 0x608...00033 logs: 0 hash: 0x36e...85f4a
status 0x1 Transaction mined and execution succeed
transaction hash 0x36e1f082dd9a95d9625fdde5ef05606a21013976be94d72ae143a30696185f4a
block hash 0x72ee6d35cc59e0cbd5ab8b1eed5049d49d473df55265e24a1f435d5916381508
block number 255
contract address 0x5171e2d7683D114e0671232005c1534c80107455
from 0x5B38Da6a701c568545dCfcB03Fc8875f56beddC4
to Registration.(constructor)
```

Supplementary Figure 1: Log showing the successful Deployment of Registration Smart Contract

```
[vm] from: 0x5B3...eddC4 to: Registration.registerCountry_1_ONS(address) 0x5C7...13682 value: 0 wei data: 0xb65...c2e6f logs: 0 hash: 0xba6...e72d4
status 0x1 Transaction mined and execution succeed
transaction hash 0xba6abdb6616a94dc4c0a8efe5197800d8b0e57bcd34ea40a19280804969e72d4
block hash 0xb993230f4965d040861a8c2a8be8c33a3f5c4d73ae31d922fe10c3bdd8ccc37e
block number 318
from 0x5B38Da6a701c568545dCfcB03Fc8875f56beddC4
to Registration.registerCountry_1_ONS(address) 0x5C7078010eA1046720D08DaeF080e1F75b813682

CALL [call] from: 0x5B38Da6a701c568545dCfcB03Fc8875f56beddC4 to: Registration.Country_1_ONS(address) data: 0x120...c2e6f
from 0x5B38Da6a701c568545dCfcB03Fc8875f56beddC4
to Registration.Country_1_ONS(address) 0x5C7078010eA1046720D08DaeF080e1F75b813682
execution cost 2597 gas (Cost only applies when called by a contract)
input 0x120...c2e6f
output 0x0000000000000000000000000000000000000000000000000000000000000001
decoded input {
  "address ": "0x461EDc88d0A4607e30a7a0EF6ef10F8370Dc2e6F"
}
decoded output {
  "0": "bool: true"
}
```

Supplementary Figure 2: Log showing the successful registration of Country 1 ONS

```

[vm] from: 0x5B3...eddC4 to: Registration.registerCountry_2_ONS(address) 0x5C7...13682 value: 0 wei data: 0xb1...47cb3 logs: 0 hash: 0x51d...ecd7d
status                                0x1 Transaction mined and execution succeed
transaction hash                      0x51d06f20c21001d58dcf95bf22f11e6a5240516f5e94e6cdf50bffa4f60ecd7d
block hash                           0x5aa279430b7d3bc64265c244845367a1f18e4e948adf33df201d7d44c34a374f
block number                          319
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerCountry_2_ONS(address) 0x5C7078010eA104672008Daef080e1F75b813682
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Country_2_ONS(address) data: 0x486...47cb3
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Country_2_ONS(address) 0x5C7078010eA104672008Daef080e1F75b813682
execution cost                        2596 gas (Cost only applies when called by a contract)
input                                 0x486...47cb3
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                         {
  "address ": "0x1520a9c6Dc3a55Dc7cD06e6E6e31Fa9072047cB3"
}
decoded output                        {
  "0": "bool: true"
}

```

Supplementary Figure 3: Log showing the successful registration of all Country 2 ONS

```

[vm] from: 0x5B3...eddC4 to: Registration.registerCountry_3_ONS(address) 0x517...07455 value: 0 wei data: 0x1f8...cabab logs: 0 hash: 0x343...6a319
status                                0x1 Transaction mined and execution succeed
transaction hash                      0x343d38a10729f6f19c1d7fd2b843c33963523355616494d33afb685a316a319
block hash                           0xa9cebb5883ca36919d33b86a8618322b1f964c919ca0048bd6404535f4e99d34
block number                          258
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerCountry_3_ONS(address) 0x5171e2d76B3D114e0671232005c1534cB0107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Country_3_ONS(address) data: 0x112...cabab
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Country_3_ONS(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                        2575 gas (Cost only applies when called by a contract)
input                                 0x112...cabab
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                         {
  "address ": "0x78731D3Ca6b7E34aC0F824c42a7cC18A495cabaB"
}
decoded output                        {
  "0": "bool: true"
}

```

Supplementary Figure 4: Log showing the successful registration of all Country 3 ONS

```

[vm] from: 0x5B3...eddC4 to: Registration.registerCountry_4_ONS(address) 0x517...07455 value: 0 wei data: 0x014...5e7f2 logs: 0 hash: 0x8f6...858b7
status                                0x1 Transaction mined and execution succeed
transaction hash                       0x8f6bcf072a29f0148d39a92dad0265054c1e10921725b3ed4f952d51bae858b7
block hash                            0x336106781bb9d0934f4bcce6efc3c46e757a4f8099ea4a972c66728b7404de25
block number                          259
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerCountry_4_ONS(address) 0x5171e2d7683D114e0671232005c1534cB0107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Country_4_ONS(address) data: 0xa7f...5e7f2
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Country_4_ONS(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                         2596 gas (Cost only applies when called by a contract)
input                                  0xa7f...5e7f2
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                          {
  "address": "0x617F2E2FD72FD9D5503197092aC168c91465E7f2"
}
decoded output                          {
  "0": "bool: true"
}

```

Supplementary Figure 5: Log showing the successful registration of Country 4 ONS

```

[vm] from: 0x5B3...eddC4 to: Registration.registerRow_ONS(address) 0x517...07455 value: 0 wei data: 0xd90...8c372 logs: 0 hash: 0xb07...bdbdc
status                                0x1 Transaction mined and execution succeed
transaction hash                       0xb07710af0f75807d43ab5f6d5c1da5ae4c984c15941659ed82b537409bcbdbdc
block hash                            0x8656071e00c2a3ec916085561eef41a462cce302bbc464ff8a23144fd4d5b67a
block number                          260
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerRow_ONS(address) 0x5171e2d7683D114e0671232005c1534cB0107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Row_ONS(address) data: 0xaa2...8c372
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Row_ONS(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                         2618 gas (Cost only applies when called by a contract)
input                                  0xaa2...8c372
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                          {
  "address": "0x17F6AD8EF982297579C203069C1DbFFE4348c372"
}
decoded output                          {
  "0": "bool: true"
}

```

Supplementary Figure 6: Log showing the successful registration of Rest-of-the-World ONS

```

status      0x1 Transaction mined and execution succeed

transaction hash      0x6f7a51c7a67454e076fe1e59afc77a6c6ab0dd2319d81982a8be5bf1209e582b ⓘ

block hash      0x61ec72786a9d20dba49ca433385e1a395f88f788d192c537f981d8681beef747 ⓘ

block number      317 ⓘ

from      0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 ⓘ

to      Registration.registerMPIO_Data_Aggregator(address) 0x5C7078010eA1046720080Daef080e1F75bB13682 ⓘ

CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.MPIO_Data_Aggregator(address) data: 0xa58...35cb2

from      0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 ⓘ

to      Registration.MPIO_Data_Aggregator(address) 0x5C7078010eA1046720080Daef080e1F75bB13682 ⓘ

execution cost      2574 gas (Cost only applies when called by a contract) ⓘ

input      0xa58...35cb2 ⓘ

output      0x0000000000000000000000000000000000000000000000000000000000000001 ⓘ

decoded input      {
  "address ": "0xab8483f64d9C6d1EcF9b849Ae677d03315835cb2"
} ⓘ

decoded output      {
  "0": "bool: true"
} ⓘ

```

Supplementary Figure 7: Log showing the successful registration of MRIO Data Aggregator

```

[vm] from: 0x5B3...eddC4 to: Registration.registerFocal_Company(address) 0x5C7...13682 value: 0 wei data: 0x1b7...c02db
status                                0x1 Transaction mined and execution succeed
transaction hash                       0x3cc0681e59f207d8da2e57e8cb7dcf5174c37da54e0341b980ed3192a3823ab1
block hash                            0xa9b8d61a65df4fa1cf002d48f58c24f866943a55c794af9017abd9f963103959
block number                          316
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerFocal_Company(address) 0x5C7078010eA1046720D08Daef080e1F75b13682
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Focal_Company(address) data: 0x50b...c02db
from                                  0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Focal_Company(address) 0x5C7078010eA1046720D08Daef080e1F75b13682
execution cost                         2573 gas (Cost only applies when called by a contract)
input                                  0x50b...c02db
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                          {
                                        "address ": "0x48209938c481177ec7E8f571ceCaE8A9e22C02db"
                                    }
decoded output                          {
                                        "0": "bool: true"
                                    }

```

Supplementary Figure 8: Log showing the successful registration of Focal Company

```

[vm] from: 0x583...eddC4 to: Registration.registerSupplier_Om_Chm(address) 0x517...07455 value: 0 wei data: 0x611...21678 logs: 0 hash: 0xf13...f8b8c
status
    0x1 Transaction mined and execution succeed
transaction hash
    0xf13e4f65284b2917105290f6ae182f1932ac9198bd7bf9dffd7bfc0b6011f8b8c
block hash
    0xb9866ac99d08608b26a256f1ed1c29cb20c8f96e4edd08c364d3005f7f195a69
block number
    264
from
    0x58380a6a701c568545dcfc803fc8875f56beddC4
to
    Registration.registerSupplier_Om_Chm(address) 0x5171e2d76830114e0671232005c1534c80107455
CALL [call] from: 0x58380a6a701c568545dcfc803fc8875f56beddC4 to: Registration.Supplier_Om_Chm(address) data: 0xc54...21678
from
    0x58380a6a701c568545dcfc803fc8875f56beddC4
to
    Registration.Supplier_Om_Chm(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost
    2595 gas (Cost only applies when called by a contract)
input
    0xc54...21678
output
    0x0000000000000000000000000000000000000000000000000000000000000001
decoded input
    {
      "address": "0x5c680f7Bf3E7ce0460398d8FA8dFD3f9F5021678"
    }
decoded output
    {
      "0": "bool: true"
    }

```

Supplementary Figure 9: Log showing the successful registration of Chemical Industry Supplier in Oman

```

[vm] from: 0x583...eddC4 to: Registration.registerSupplier_Ae_Chm_1(address) 0x517...07455 value: 0 wei data: 0xf37...40225 logs: 0 hash: 0x524...8ace2
status
    0x1 Transaction mined and execution succeed
transaction hash
    0x524cdd6eb82d5affa44eb529c04061ecf4df060cf679740a0d35f56d298ace2
block hash
    0x89c7c6978c87d19ccf15fa6390bcb07e9c557c6bc406d8519670656dbca75573
block number
    261
from
    0x58380a6a701c568545dcfc803fc8875f56beddC4
to
    Registration.registerSupplier_Ae_Chm_1(address) 0x5171e2d76830114e0671232005c1534c80107455
CALL [call] from: 0x58380a6a701c568545dcfc803fc8875f56beddC4 to: Registration.Supplier_Ae_Chm_1(address) data: 0x0e0...40225
from
    0x58380a6a701c568545dcfc803fc8875f56beddC4
to
    Registration.Supplier_Ae_Chm_1(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost
    2598 gas (Cost only applies when called by a contract)
input
    0x0e0...40225
output
    0x0000000000000000000000000000000000000000000000000000000000000001
decoded input
    {
      "address": "0x583031D1113aD414F02576806afa8fb302140225"
    }
decoded output
    {
      "0": "bool: true"
    }

```

Supplementary Figure 10: Log showing the successful registration of Chemical Industry Supplier 1 in Oman

```

[vm] from: 0x583...eddC4 to: Registration(registerSupplier_Ae_Chm_2(address)) 0x517...07455 value: 0 wei data: 0xc88...92148 logs: 0 hash: 0x528...5b437
status      0x1 Transaction mined and execution succeed
transaction hash  0x528bdf8b7b5a9f7afb97935b0cf271c8a4cfb2c4b53a00238ec0c2b669b5b437
block hash      0x7eb776f99c93c93f86abd06189611ca81ffd15d559ea98397fdc0fccf9d354aa
block number    262
from           0x58380a6a701c568545dcfc803fc8875f56beddC4
to             Registration(registerSupplier_Ae_Chm_2(address)) 0x5171e2d76830114e0671232005c1534c80107455
CALL [call] from: 0x58380a6a701c568545dcfc803fc8875f56beddC4 to: Registration.Supplier_Ae_Chm_2(address) data: 0xedf...92148

from          0x58380a6a701c568545dcfc803fc8875f56beddC4
to            Registration.Supplier_Ae_Chm_2(address) 0x876197308cAebE9E0E88c703608D33598E2c058
execution cost 2616 gas (Cost only applies when called by a contract)
input          0xedf...92148
output         0x0000000000000000000000000000000000000000000000000000000000000001
decoded input  {
  "address": "0xd0870fA1b7C4700F2B07f44238821C26f7392148"
}
decoded output {
  "0": "bool: true"
}

```

Supplementary Figure 11: Log showing the successful registration of Chemical Industry Supplier 2 in UAE

```

[vm] from: 0x583...eddC4 to: Registration(registerSupplier_Ae_Chm_3(address)) 0x517...07455 value: 0 wei data: 0xe76...049ec logs: 0 hash: 0xd48...9982c
status      0x1 Transaction mined and execution succeed
transaction hash  0xd4807b692ac17e9f40af947b7679960c9cbe2be9a99bfff7107593a9aebb9982c
block hash      0x352a1efea3bedbc9a08de31910a200e16b6f4232cca5fb275de3f14abf4177a3
block number    263
from           0x58380a6a701c568545dcfc803fc8875f56beddC4
to             Registration(registerSupplier_Ae_Chm_3(address)) 0x5171e2d76830114e0671232005c1534c80107455
CALL [call] from: 0x58380a6a701c568545dcfc803fc8875f56beddC4 to: Registration.Supplier_Ae_Chm_3Exists(address) data: 0x9cb...f8ad7

from          0x58380a6a701c568545dcfc803fc8875f56beddC4
to            Registration.Supplier_Ae_Chm_3Exists(address) 0x876197308cAebE9E0E88c703608D33598E2c058
execution cost 2656 gas (Cost only applies when called by a contract)
input          0x9cb...f8ad7
output         0x0000000000000000000000000000000000000000000000000000000000000001
decoded input  {
  "address C3": "0x55a1Dd406d51c686827c3940A63c03cb113F8Ad7"
}
decoded output {
  "0": "bool: true"
}

```

Supplementary Figure 12: Log showing the successful registration of Chemical Industry Supplier 3 in UAE

```

[vm] from: 0x5B3...eddC4 to: Registration.registerSupplier_Om_Poly(address) 0x517...07455 value: 0 wei data: 0x10b...d1ff7 logs: 0 hash: 0xaf3...a6dc2
status      0x1 Transaction mined and execution succeed
transaction hash      0xaf318378395f67eb5e4c5b6db84090387e6ffa382b9406746eee378f0f0a6dc2
block hash      0x4bdadfe3256b124d6cdef0c71181a2009cf86be0ba96a375502d26c770678d62
block number      265
from      0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to      Registration.registerSupplier_Om_Poly(address) 0x5171e2d7683D114e0671232005c1534cB0107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Supplier_Om_Poly(address) data: 0x94a...d1ff7

from      0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to      Registration.Supplier_Om_Poly(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost      2596 gas (Cost only applies when called by a contract)
input      0x94a...d1ff7
output      0x0000000000000000000000000000000000000000000000000000000000000001
decoded input      {
  "address ": "0x03C6fcED478c8bC9a4fA834ef9f40767739D1Ff7"
}
decoded output      {
  "0": "bool: true"
}

```

Supplementary Figure 13: Log showing the successful registration of Polymer Industry Supplier in Oman

```

[vm] from: 0x5B3...eddC4 to: Registration.registerSupplier_Ku_Poly(address) 0x517...07455 value: 0 wei data: 0x12...e454c logs: 0 hash: 0xf42...5f0eb
status      0x1 Transaction mined and execution succeed
transaction hash      0xf42b31b8837b6809924a6793c1369be218fcd82566082b1486c92c76d8e5f0eb
block hash      0xff44c1bc86517d8203704889f786f068c674b6e85f566d803761c0529c371cff
block number      266
from      0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to      Registration.registerSupplier_Ku_Poly(address) 0x5171e2d7683D114e0671232005c1534cB0107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Supplier_Ku_Poly(address) data: 0xd9e...e454c

from      0x5B38Da6a701c568545dCfcB03FcB875f56beddC4
to      Registration.Supplier_Ku_Poly(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost      2573 gas (Cost only applies when called by a contract)
input      0xd9e...e454c
output      0x0000000000000000000000000000000000000000000000000000000000000001
decoded input      {
  "address ": "0x1aE0EA34a72D944a8C7e03fF83eC30a6669E454C"
}
decoded output      {
  "0": "bool: true"
}

```

Supplementary Figure 14: Log showing the successful registration of Polymer Industry Supplier in Kuwait

```

[vm] from: 0x5B3...eddC4 to: Registration.registerSupplier_Qa_Poly(address) 0x517...07455 value: 0 wei data: 0xcb3...a733c logs: 0 hash: 0x974...5cd1a
status                                0x1 Transaction mined and execution succeed
transaction hash                       0x9746863af30506204a4f29836bfd16b22b2616c17c5d047cba6960490b5cd1a
block hash                            0x7b368e0b59d7b786cfca86cd35569ede1cc88aae957b03cefb55c890ef30275a
block number                          267
from                                  0x5B38Da6a701c568545dCfcB03FcB875F56beddC4
to                                    Registration.registerSupplier_Qa_Poly(address) 0x5171e2d7683D114e0671232005c1534c00107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875F56beddC4 to: Registration.Supplier_Qa_Poly(address) data: 0x89e...a733c
from                                  0x5B38Da6a701c568545dCfcB03FcB875F56beddC4
to                                    Registration.Supplier_Qa_Poly(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                        2574 gas (Cost only applies when called by a contract)
input                                  0x89e...a733c
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                         {
  "address ": "0xC35b7d915458EF540aDe6068dFe2F44E8fa733c"
}
decoded output                        {
  "0": "bool: true"
}

```

Supplementary Figure 15: Log showing the successful registration of Polymer Industry Supplier in Qatar

```

[vm] from: 0x5B3...eddC4 to: Registration.registerSupplier_Ku_Meta(address) 0x517...07455 value: 0 wei data: 0x378...c70dc logs: 0 hash: 0xffb...88ea2
status                                0x1 Transaction mined and execution succeed
transaction hash                       0xffb35493fb2c0113708c56e04fb1902dfc78c0fd84c0c5ed07e626976de88ea2
block hash                            0x3325a3b16d68b648e842218bf06c02383d4172228edc5b53d58cbc3bdd62a5
block number                          271
from                                  0x5B38Da6a701c568545dCfcB03FcB875F56beddC4
to                                    Registration.registerSupplier_Ku_Meta(address) 0x5171e2d7683D114e0671232005c1534c00107455
CALL [call] from: 0x5B38Da6a701c568545dCfcB03FcB875F56beddC4 to: Registration.Supplier_Ku_Meta(address) data: 0xcd...c70dc
from                                  0x5B38Da6a701c568545dCfcB03FcB875F56beddC4
to                                    Registration.Supplier_Ku_Meta(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                        2595 gas (Cost only applies when called by a contract)
input                                  0xcd...c70dc
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                         {
  "address ": "0xA098Eda01Ce92ff4A4ACcb7A4FFfb5A43EBC70DC"
}
decoded output                        {
  "0": "bool: true"
}

```

Supplementary Figure 16: Log showing the successful registration of Metal Industry Supplier in Kuwait



```

[vm] from: 0x583...eddC4 to: Registration.registerSupplier_Qa_Meta_1(address) 0x517...07455 value: 0 wei data: 0x42a...c160c logs: 0 hash: 0x7e7...9a44c
status                                0x1 Transaction mined and execution succeed
transaction hash                       0x7e78c4ca1548c33692cb2748f34764709fe13ca49be7d1c33196bc3741b9a44c
block hash                            0x154dee158cea38c698e9e3aa117c1cdf59375bcaefce9507f3e350f82c09c22
block number                          268
from                                  0x58380a6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerSupplier_Qa_Meta_1(address) 0x5171e2d7683D114e0671232805c1534cB0107455
CALL [call] from: 0x58380a6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Supplier_Qa_Meta_1(address) data: 0x672...c160c
from                                  0x58380a6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Supplier_Qa_Meta_1(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                        2617 gas (Cost only applies when called by a contract)
input                                 0x672...c160c
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                         {
  "address ": "0x14723A09ACFF602A60CdF7aA4AF308FDDC160C"
}
decoded output                        {
  "0": "bool: true"
}

```

Supplementary Figure 17: Log showing the successful registration of Metal Industry Supplier 1 in Qatar

```

[vm] from: 0x583...eddC4 to: Registration.registerSupplier_Qa_Meta_2(address) 0x517...07455 value: 0 wei data: 0x2dc...4d2db logs: 0 hash: 0x801...3042b
status                                0x1 Transaction mined and execution succeed
transaction hash                       0x801129d4e81517738ea80a4bde759edf56e4ed7896edcd5bfe7ccbc4a083042b
block hash                            0x3b5a1b8cb5c9ede7dfd3e5568237f106510ebbe6ffa45ed942a463e544d002f2
block number                          269
from                                  0x58380a6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.registerSupplier_Qa_Meta_2(address) 0x5171e2d7683D114e0671232805c1534cB0107455
CALL [call] from: 0x58380a6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Supplier_Qa_Meta_2(address) data: 0xc6e...4d2db
from                                  0x58380a6a701c568545dCfcB03FcB875f56beddC4
to                                    Registration.Supplier_Qa_Meta_2(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost                        2617 gas (Cost only applies when called by a contract)
input                                 0xc6e...4d2db
output                                0x0000000000000000000000000000000000000000000000000000000000000001
decoded input                         {
  "address ": "0x4B0897b0513fdC7C541B6d9D7E929C4e5364D2dB"
}
decoded output                        {
  "0": "bool: true"
}

```

Supplementary Figure 18: Log showing the successful registration of Metal Industry Supplier 2 in Qatar

```

[vm] from: 0x583...eddC4 to: Registration.registerSupplier_RoW_Meta(address) 0x517...07455 value: 0 wei data: 0xcd...56288 logs: 0 hash: 0xd0f...0869b
status      0x1 Transaction mined and execution succeed
transaction hash  0xd0f8c32970892168a5f973f85d31526a691103ba6f3873bfaf92a7f425d0869b
block hash      0x20b2fda1bd021c30d02a925697af12999af9d0e55f2698ad87e537002fb8142
block number    270
from          0x58380a6a701c568545dCfcB03FcB875f56beddC4
to            Registration.registerSupplier_RoW_Meta(address) 0x5171e2d7683D114e0671232805c1534cB0107455
CALL [call] from: 0x58380a6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Supplier_RoW_Meta(address) data: 0x199...2eabd
from          0x58380a6a701c568545dCfcB03FcB875f56beddC4
to            Registration.Supplier_RoW_Meta(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost 2619 gas (Cost only applies when called by a contract)
input         0x199...2eabd
output        0x0000000000000000000000000000000000000000000000000000000000000001
decoded input {
  "address ": "0x6eCd876c68CC749Eae80803eFFdA155fEd2eabd"
}
decoded output {
  "0": "bool: true"
}

```

Supplementary Figure 19: Log showing the successful registration of Metal Industry Supplier in Rest-of-the-World region

```

[vm] from: 0x583...eddC4 to: Registration.registerSupplier_Ae_Ele(address) 0x876...2c058 value: 0 wei data: 0xc9f...2eb9e logs: 0 hash: 0xad5...3caea
status      0x1 Transaction mined and execution succeed
transaction hash  0xad59aef5c784854cd2bf33ff50caa3776abb16b8cf593ae0c1fe7fd1533caea
block hash      0x32ce6594c1b305b4d7acff94f62d5ccebdf0064cd60dcfa367903bd17e7864
block number    285
from          0x58380a6a701c568545dCfcB03FcB875f56beddC4
to            Registration.registerSupplier_Ae_Ele(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
CALL [call] from: 0x58380a6a701c568545dCfcB03FcB875f56beddC4 to: Registration.Supplier_Ae_Ele(address) data: 0x446...2eb9e
from          0x58380a6a701c568545dCfcB03FcB875f56beddC4
to            Registration.Supplier_Ae_Ele(address) 0x876197308cAebE9E0DE88c703608D33598E2c058
execution cost 2640 gas (Cost only applies when called by a contract)
input         0x446...2eb9e
output        0x0000000000000000000000000000000000000000000000000000000000000001
decoded input {
  "address ": "0x71213191Aa7Fca82f493Cb0f9cc6de6a7ef2Eb9E"
}
decoded output {
  "0": "bool: true"
}

```

Supplementary Figure 20: Log showing the successful registration of Electricity Supplier in UAE

```

[vm] from: 0x152...47cB3 to: InputOutputIntermediateConsumption.(constructor) value: 0 wei data: 0x608...2c058 logs: 0 hash: 0x353...5fa2c
status
    0x1 Transaction mined and execution succeed
transaction hash
    0x353aff30f367d9441fe049b0c635387ce7e4df340cada3c6a38ffba6125fa2c
block hash
    0x10f6ca3e99907ba503412bd7075d225086939ab8783e8f0cd780203fecc852f1
block number
    295
contract address
    0x86bc54893f3d366cAB2892a7c369D8577302087E
from
    0x1520a9c6Dc3a55Dc7cD06e6E6e31Fa9072047cB3
to
    InputOutputIntermediateConsumption.(constructor)

```

Supplementary Figure 21: Log showing the successful deployment of InputOutputIntermediateConsumption Contract

```

[vm] from: 0x461...c2e6F to: InputOutputIntermediateConsumption.UpdateCountry_1_ICM(uint256[20][4]) 0x9C9...a042a value: 0 wei data: 0x6d3...00000 logs: 1 hash: 0x37bc58d520cee7e39dfaf6e20f41d467ccd166a3d8ded50365681b1b9b28247
status
    0x1 Transaction mined and execution succeed
transaction hash
    0x37bc58d520cee7e39dfaf6e20f41d467ccd166a3d8ded50365681b1b9b28247
block hash
    0xee4620422292a75906e1dfb8066850a942aee7757904b31a2abe71dbbdac44f8
block number
    322
from
    0x461Edc88d0A4607e30a7a8EF6ef10F8378D0c2e6F
to
    InputOutputIntermediateConsumption.UpdateCountry_1_ICM(uint256[20][4]) 0x9C9FF5DE0968df850905E74bAA6a17FED18a042a
logs
    [{"from": "0x9C9FF5DE0968df850905E74bAA6a17FED18a042a",
      "topic": "0x88d1f86e68e55bedc845173570168fad7f82b65e2c471e2f2a20a563c7d7caf9",
      "event": "Country_1_ICM_Updated",
      "matrixZ1": [
        [
          "5891", "234", "24", "4817",
          "1517", "1179", "331", "1194",
          "855", "230", "29011", "4101",
          "0", "0", "0", "6757",
          "879", "7", "2", "0",
          "78", "25", "12", "0",
          "33", "2", "536", "0",
          "0", "0", "0", "0",
          "1544", "10", "1", "0",
          "113", "31", "5", "0",
          "212", "9", "1098", "0",
          "0", "0", "0", "0",
          "625", "21", "21", "0",
          "103", "148", "236", "0",
          "49", "11", "11137", "0",
          "0", "0", "0", "0",
          "60199", "508", "22", "0",
          "20757", "4163", "173", "0",
          "959", "50", "11930", "0",
          "1628", "16", "6", "0"
        ],
        ],
        ],
        ]
    ]

```

Supplementary Figure 22: Log showing the successful updating of Country 1 Intermediate Consumption Matrix (ICM)



```
[vm] from: 0x617...5E7F2 to: InputOutputIntermediateConsumption.UpdateCountry_4_ICM(uint256[20][4]) 0x86b...2087E value: 0 wei data: 0x8bd...00008 logs: 1 hash: 0xd80...8b119

status
transaction hash
block hash
block number
from
to
decoded output
logs

{
  "from": "0x86bC54893F3D366cA82892a7c369D8577302087E",
  "topic": "0xba598c094fef7f2e5955c9c4663bbec82716f9418656e7f6718d2b183ee7b26",
  "event": "Country_4_ICM_Updated",
  "args": {
    "0": [
      "matrix24": [
        [
          "10861", "176", "16", "0",
          "1910", "1309", "187", "0",
          "1563", "131", "16554", "0",
          "0", "0", "0", "0",
          "3404", "42", "10", "0",
          "303", "157", "55", "0",
          "129", "11", "2413", "0",
          "0", "0", "0", "0",
          "2330", "12", "4", "0",
          "185", "98", "29", "0",
          "347", "29", "3993", "0",
          "0", "0", "0", "0",
          "131533", "5243", "593", "22049",
          "31610", "24715", "7495", "5124",
          "10444", "2829", "390162", "18248",
          "2", "1", "0", "83193",
          "257288", "2143", "180", "1",
          "109536", "13184", "1421", "0",
          "5874", "265", "72451", "2",
          "6880", "96", "346", "8"
        ]
      ]
    ]
  }
}
```

Supplementary Figure 25: Log showing the successful updating of Country 4 Intermediate Consumption Matrix (ICM)

```
[vm] from: 0x17F...8c372 to: InputOutputIntermediateConsumption.UpdateRow_ICM(uint256[20][4]) 0x86b...2087E value: 0 wei data: 0xc8c...559f4 logs: 1 hash: 0x77b...5741c

status
transaction hash
block hash
block number
from
to
decoded output
logs

{
  "from": "0x86bC54893F3D366cA82892a7c369D8577302087E",
  "topic": "0x3b49cf25fb41f7e28cbe06f9f51afc7b9c66d377a7bd5a0808f5fdce65a3776",
  "event": "Row_ICM_Updated",
  "args": {
    "0": [
      "matrix25": [
        [
          "13981", "197", "0", "31",
          "2459", "1489", "0", "408",
          "2809", "190", "0", "36212",
          "0", "0", "0", "0",
          "19776", "313", "0", "84",
          "1755", "1197", "0", "492",
          "749", "80", "0", "21595",
          "0", "0", "0", "0",
          "20543", "371", "0", "0",
          "1499", "1160", "0", "59",
          "2814", "346", "0", "12930",
          "0", "0", "0", "0",
          "88171", "1235", "8", "326",
          "14467", "8668", "0", "3656",
          "6956", "660", "1", "172104",
          "1", "0", "13", "0",
          "10933862", "4709677", "11404664", "157624",
          "41195056", "28344875", "4818949", "1310506",
          "2208669", "469178", "16092583", "747340",
          "1864458", "333863", "15278522", "350708"
        ]
      ]
    ]
  }
}
```

Supplementary Figure 26: Log showing the successful updating of Row-of-the-World Intermediate Consumption Matrix (ICM)

```

[vm] from: 0x712...2Eb9E to: InputOutputIntermediateConsumption.Input_Ae_EleDemand(uint256) 0x86b...2087E value: 0 wei data: 0x1c7...04a38 logs: 1 hash: 0x9...
status
    @x1 Transaction mined and execution succeed
transaction hash
    0x97b2fb7af7b425e169f366c606bd75b1ea526effee1b2401e16128f5772069
block hash
    0xb1313fd432b35f2996b6699817e91dd5a7f397f3bbfb15f0c11c7976d9f22593
block number
    302
from
    0x71213191Aa7Fca82f493Cb0f9cc6de6a7ef2Eb9E
to
    InputOutputIntermediateConsumption.Input_Ae_EleDemand(uint256) 0x86bC54893F3D366cAB2892a7c369D8577302087E
decoded input
    {
        "uint256_Y11": "19000"
    }
decoded output
    {}
logs
    [
        {
            "from": "0x86bC54893F3D366cAB2892a7c369D8577302087E",
            "topic": "0x47dafdd7ea6aaebccdf24bcb80aa5bb81866e022dadd954edd132a2907b1a4",
            "event": "Ae_EleDemandUpdated",
            "args": {
                "0": "19000",
                "Y11": "19000"
            }
        }
    ]

```

Supplementary Figure 27: Log showing the successful updating of Electricity Demand in UAE

```

[vm] from: 0x583...40225 to: InputOutputIntermediateConsumption.Input_Chm_1Demand(uint256) 0x86b...2087E value: 0 wei data: 0x95f...02ee0 logs: 1 hash: 0xf...
status
    @x1 Transaction mined and execution succeed
transaction hash
    0xfb06688e2ab029f59065fbcde102acf0fd7707d6dcb8227df86622f328699d11
block hash
    0x21ccaaeeb0f5d229e3c53a439f1d05871349e9202daa293891ba620f6683ba14
block number
    303
from
    0x583031D113a0414f025768D6afa8Fb302140225
to
    InputOutputIntermediateConsumption.Input_Chm_1Demand(uint256) 0x86bC54893F3D366cAB2892a7c369D8577302087E
decoded input
    {
        "uint256_Y8": "12000"
    }
decoded output
    {}
logs
    [
        {
            "from": "0x86bC54893F3D366cAB2892a7c369D8577302087E",
            "topic": "0x93c3c7501bf938f92529abb149e799efa4db6f7b0f6c60223d9b31e3a3a493546",
            "event": "Ae_Chm_1DemandUpdated",
            "args": {
                "0": "12000",
                "Y8": "12000"
            }
        }
    ]

```

Supplementary Figure 28: Log showing the successful updating of Chemical Products Demand by Supplier 1 in UAE

```

[vm] from: 0xd08...92148 to: InputOutputIntermediateConsumption, Input_Chm_2Demand(uint256) 0x86b...2087E value: 0 wei data: 0x2d5...02ee0 logs: 1 hash: 0xea2...6f588

status      0x1 Transaction mined and execution succeed

transaction hash  0xea2f3a7b57c377644ea4cc4cf1e9192a52ba0b3ca17f0a5c2cbb783c9c6f588

block hash      0x550c9f5d8487f6598e69bbaac609d20740fd59020791842a196acd04fc33591

block number     384

from           0xd0870fa1b7c4700f2807f44238821c26f7392148

to             InputOutputIntermediateConsumption, Input_Chm_2Demand(uint256) 0x86bc54893f3d366cAB2892a7c369D8577302087E

decoded input    {
  "uint256 y9": "12000"
}

decoded output   {}

logs            [
  {
    "from": "0x86bc54893f3d366cAB2892a7c369D8577302087E",
    "topic": "0x4add1a8d765fefdbdd66e3008c6cde3c90bb4c4cbbaeec4dc89d01b381b7395",
    "event": "Ae_Chm_2DemandUpdated",
    "args": {
      "y8": "12000",
      "y9": "12000"
    }
  }
]

```

Supplementary Figure 29: Log showing the successful updating of Chemical Products Demand by Supplier 2 in UAE

```

[vm] from: 0x55a...F8Ad7 to: InputOutputIntermediateConsumption, Input_Chm_3Demand(uint256) 0x86b...2087E value: 0 wei data: 0x334...01f40 logs: 1 hash: 0xbad5b0f816b7defc71df69c55c2ceebc141ec49b733fca62c3b62716d92e087

status      0x1 Transaction mined and execution succeed

transaction hash  0xbad5b0f816b7defc71df69c55c2ceebc141ec49b733fca62c3b62716d92e087

block hash      0xac2e1f355ee7d698bd799c18974c99ea66fda3283ac4e20910a3afd11045e8d

block number     386

from           0x55a1Dd406d51c686827c3940A63c03cb113F8Ad7

to             InputOutputIntermediateConsumption, Input_Chm_3Demand(uint256) 0x86bc54893f3d366cAB2892a7c369D8577302087E

decoded input    {
  "uint256 y10": "8000"
}

decoded output   {}

logs            [
  {
    "from": "0x86bc54893f3d366cAB2892a7c369D8577302087E",
    "topic": "0x4b7d83dafebdc1c977a96d23e5a23dc4c358d286f2ae40e95b2a22642cc79f2a",
    "event": "Ae_Chm_3DemandUpdated",
    "args": {
      "y10": "8000"
    }
  }
]

```

Supplementary Figure 30: Log showing the successful updating of Chemical Products Demand by Supplier 3 in UAE

```

[vm] from: 0x0A0...C70DC to: InputOutputIntermediateConsumption.Input_Ku_MetaDemand(uint256) 0x86b...2087E value: 0 wei data: 0xb0e...0364c logs
status
    0x1 Transaction mined and execution succeed
transaction hash
    0x4de7618237529f5c2e9855f956f50dfc10d37d5d17aa8dc91cd3f415b3635b31
block hash
    0x5b5874a435c286b10e0a23088119f889e3664df90b7bcc389d37526cefd7d276
block number
    307
from
    0x0A098E8a01Ce92ff4A4CCb7A4FFfb5A43EBC70DC
to
    InputOutputIntermediateConsumption.Input_Ku_MetaDemand(uint256) 0x86bC54893F3D366cAB2892a7c36908577302087E
decoded input
    {
      "uint256 Y4": "13900"
    }
decoded output
    {}
logs
    [
      {
        "from": "0x86bC54893F3D366cAB2892a7c36908577302087E",
        "topic": "0x8112b8cd1db5ceb0bb3ddc9ca914e38dd1b107b4f4d839db7a8f7241dd81f57",
        "event": "Ku_MetaDemandUpdated",
        "args": {
          "0": "13900",
          "Y4": "13900"
        }
      }
    ]

```

Supplementary Figure 31: Log showing the successful updating of Metal Products Demand by Supplier in Kuwait

```

[vm] from: 0x1aE...E454C to: InputOutputIntermediateConsumption.Input_Ku_PolyDemand(uint256) 0x86b...2087E value: 0 wei data: 0xf25...02260 logs:
status
    0x1 Transaction mined and execution succeed
transaction hash
    0xc427e148664d3961bdd6c6f90ca72c85d178db61c1a9b7a293dec64e602a6045
block hash
    0x95408e6a4eabd9aef9b280f3b70c9cf69e15644ffc92782b6721155427129d1c
block number
    308
from
    0x1aE0EA3a72D944a8C7603Ff83eC30a6669E454C
to
    InputOutputIntermediateConsumption.Input_Ku_PolyDemand(uint256) 0x86bC54893F3D366cAB2892a7c36908577302087E
decoded input
    {
      "uint256 Y3": "8800"
    }
decoded output
    {}
logs
    [
      {
        "from": "0x86bC54893F3D366cAB2892a7c36908577302087E",
        "topic": "0xa71b16e966aee0b3f1daada9a34c594bb847babd209f584110f26cd68cd5216",
        "event": "Ku_PolyDemandUpdated",
        "args": {
          "0": "8800",
          "Y3": "8800"
        }
      }
    ]

```

Supplementary Figure 32: Log showing the successful updating of Polymer Products Demand by Supplier in Kuwait



```

[vm] from: 0x5c6...21678 to: InputOutputIntermediateConsumption Input_Om_ChmDemand(uint256) 0x86b...2087E value: 0 wei data: 0x7d9...03908 logs
status
    0x1 Transaction mined and execution succeed
transaction hash
    0x3930cdf4aeeef295b73bd15355cec57d924da5046e44fe445ee9bbe92583d4a39
block hash
    0x6c637f2e92ba2abf29b5232016723655cfc5748953567348424f9dede5015daa
block number
    309
from
    0x5c600f7bf3e7ce0460398d8fABdF03f9F5021678
to
    InputOutputIntermediateConsumption.Input_Om_ChmDemand(uint256) 0x86bC54893F3D366cAB2892a7c369D8577302087E
decoded input
    {
        "uint256 Y1": "14600"
    }
decoded output
    {}
logs
    [
        {
            "from": "0x86bC54893F3D366cAB2892a7c369D8577302087E",
            "topic": "0xcd83fb5c54b8a3ae32e9bde28d09e55ce6bc156983102ac0fcd3ae9d1741",
            "event": "Om_ChmDemandUpdated",
            "args": {
                "0": "14600",
                "Y1": "14600"
            }
        }
    ]

```

Supplementary Figure 33: Log showing the successful updating of Chemical Products Demand by Supplier in Oman

```

[vm] from: 0x03C...D1Ff7 to: InputOutputIntermediateConsumption Input_Om_PolyDemand(uint256) 0x86b...2087E value: 0 wei data: 0x157...0251c logs
status
    0x1 Transaction mined and execution succeed
transaction hash
    0x68ac6eaaad1f42ca5be992ce8698caf42c38d10a80c3a7aa9faf2fe9c15ced591
block hash
    0x758f9aa2b5341537e289e9a7bca367e323d7234e4061dc1186f6322a285fd391
block number
    310
from
    0x03C6FcED478cBbC9a4FAB34eF9f40767739D1FF7
to
    InputOutputIntermediateConsumption.Input_Om_PolyDemand(uint256) 0x86bC54893F3D366cAB2892a7c369D8577302087E
decoded input
    {
        "uint256 Y2": "9500"
    }
decoded output
    {}
logs
    [
        {
            "from": "0x86bC54893F3D366cAB2892a7c369D8577302087E",
            "topic": "0x65e6c849c6561412ea028c8421c52a742c1f72cbb7ba5e648c6f3f17c6bc2302",
            "event": "Om_PolyDemandUpdated",
            "args": {
                "0": "9500",
                "Y2": "9500"
            }
        }
    ]

```

Supplementary Figure 34: Log showing the successful updating of Polymer Products Demand by Supplier in Oman

```

[vm] from: 0x6eC...2eabd to: InputOutputIntermediateConsumption.Input_Row_MetaDemand(uint256) 0x86b...2087E value: 0 wei data: 0x536...03e80
status                                0x1 Transaction mined and execution succeed
transaction hash                       0xf66f9151fda328583175c467a28a5fa86694145820981ff6492863ee244c0963
block hash                            0xfd60d55ab766a6311d02cba7461ae75a8bfe76d2f9fbfe5fabcaaa6fd29e95db
block number                          311
from                                  0x6eCd876c6CC749Eae80803eFFdA155Fd2eabd
to                                    InputOutputIntermediateConsumption.Input_Row_MetaDemand(uint256) 0x86bC54893F3D366cAB2892a7c369D8577302087E
decoded input                          {
  "uint256 Y12": "16000"
}
decoded output                        {}
logs                                  [
  {
    "from": "0x86bC54893F3D366cAB2892a7c369D8577302087E",
    "topic": "0xa55b194c1a3adc01b76553b6c2b2b6a24a69e992ed7ce42faca0098f8fd091d",
    "event": "Row_MetaDemandUpdated",
    "args": {
      "0": "16000",
      "Y12": "16000"
    }
  }
]

```

Supplementary Figure 35: Log showing the successful updating of Metal Products Demand by Supplier in Rest-of-the-World

```

[vm] from: 0xCA3...a733c to: InputOutputIntermediateConsumption.Input_Qa_PolyDemand(uint256) 0x86b...2087E value: 0 wei data: 0xb0a...03e80
status                                0x1 Transaction mined and execution succeed
transaction hash                       0x4acF40c37335e79d407f809b5972127c8c25d68d9cc66c4b9478d210b70760ff
block hash                            0x5b333e016e4d19a881c83ce9b643d6e7bbb343fdbc9eda60cd486b659deea791
block number                          312
from                                  0xCA35b7d915458EF540aDe6068dFe2F44E8fa733c
to                                    InputOutputIntermediateConsumption.Input_Qa_PolyDemand(uint256) 0x86bC54893F3D366cAB2892a7c369D8577302087E
decoded input                          {
  "uint256 Y5": "16000"
}
decoded output                        {}
logs                                  [
  {
    "from": "0x86bC54893F3D366cAB2892a7c369D8577302087E",
    "topic": "0xd0b6a4117a1d3bd4a1619cf40eebf65c14b0c2e4291cc586b5ffac4bc1cca712",
    "event": "Qa_PolyDemandUpdated",
    "args": {
      "0": "16000",
      "Y5": "16000"
    }
  }
]

```

Supplementary Figure 36: Log showing the successful updating of Polymer Products Demand by Supplier in Qatar

Supplementary Table 1: Intermediate Consumption Matrix (Z)

			Country 1 (Oman)				Country 2 (Kuwait)				Country 3 (Qatar)				Country 4 (UAE)				Rest-of-the-World			
			Chemical	Polymer	Metal	Electricity	Chemical	Polymer	Metal	Electricity	Chemical	Polymer	Metal	Electricity	Chemical	Polymer	Metal	Electricity	Chemical	Polymer	Metal	Electricity
	Country 1 (Oman)	Chemical	58.91	15.17	8.55	0	8.79	0.78	0.33	0	15.44	1.13	2.12	0	6.25	1.03	0.49	0	601.99	207.57	9.59	16.28
		Polymer	2.34	11.79	2.3	0	0.07	0.25	0.02	0	0.1	0.31	0.09	0	0.21	1.48	0.11	0	5.08	41.63	0.5	0.16
		Metal	0.24	3.31	290.11	0	0.02	0.12	5.36	0	0.01	0.05	10.98	0	0.21	2.36	111.37	0	0.22	1.73	119.3	0.06
		Electricity	48.17	11.94	41.91	67.57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Country 2 (Kuwait)	Chemical	0.63	0.11	0.09	0	110.53	14.43	4.24	0.01	10.16	0.74	1.39	0	5.25	0.86	0.41	0	954.74	377.56	14.56	42.9
		Polymer	0	0.01	0	0	4.41	11.28	1.15	0	0.08	0.24	0.07	0	0.03	0.2	0.02	0	0.29	1.75	0.06	0
		Metal	0	0	0.09	0	0.48	3.3	142.95	0	0	0	0.53	0	0	0.01	0.45	0	0.08	0.67	14.84	0.05
		Electricity	0	0	0	0	0.03	0	0.02	1301.12	0	0	0	0	0	0	0	0	0	0	0	0
	Country 3 (Qatar)	Chemical	3.5	0.62	0.5	0	1.76	0.16	0.07	0	262.15	28.07	36.02	0.01	3.5	0.57	0.28	0	1670.78	515.63	32.01	47.52
		Polymer	0.02	0.14	0.02	0	0	0.01	0	0	10.18	21.37	9.49	0	0.01	0.06	0	0	0.29	2.29	0.03	0.01
		Metal	0	0.02	2.04	0	0	0.01	0.25	0	0.99	5.58	1123.72	0	0.05	0.56	26.34	0	0.43	0.76	38.66	0.02
		Electricity	0	0	0	0	0	0	0	0	114.23	11.83	88.07	164.84	0	0	0	0	0	0	0	0.03
	Country 4 (UAE)	Chemical	108.61	19.1	15.63	0	34.04	3.03	1.29	0	25.3	1.85	3.47	0	1315.33	316.1	104.44	0.02	2572.88	1095.36	58.74	68.8
		Polymer	1.76	13.09	1.71	0	0.42	1.57	0.11	0	0.32	0.98	0.29	0	52.43	247.15	28.29	0.01	21.43	131.84	2.65	0.96
		Metal	0.16	1.87	165.54	0	0.1	0.55	24.13	0	0.04	0.2	39.93	0	5.93	74.95	3501.62	0	1.8	14.21	724.51	3.46
		Electricity	0	0	0	0	0	0	0	0	0	0	0	0	220.49	51.24	182.48	831.93	0.01	0	0.02	0.08
	Rest-of-the-World	Chemical	139.81	24.59	20.09	0	197.76	17.55	7.49	0	205.43	14.99	28.14	0	881.71	144.67	69.56	0.01	1039339	411950.6	22006.69	18644.58
		Polymer	1.97	14.89	1.9	0	3.13	11.97	0.8	0	3.71	11.6	3.46	0	12.35	86.68	6.6	0	47096.77	283448.8	4691.78	3338.63
		Metal	0	0	0	0	0	0	0	0	0	0	0	0	0.08	0	0.01	0.13	114046.6	48189.49	160925.8	152785.2
		Electricity	0.31	4.08	362.12	0	0.84	4.92	215.95	0	0.09	0.59	129.3	0	3.26	36.56	1721.04	0	1576.24	13105.06	747339.7	3507.08
		Output	2891.28	780.74	2367.92	2223.09	4446.65	516.74	1050.53	9890.04	7373.43	1013.14	5519.18	2343.05	27403.06	9248.05	19278.08	12063.02	3732402	2035283	2623273	2874747
		Carbon emissions	3.895275	1.193152	2.843123	14.53232	5.946167	0.931505	0.68661	40.74667	8.685134	1.030444	1.374334	18.54859	15.52457	4.525441	6.936519	43.81777	660.1689	91.60576	1102.881	12560.83

Supplementary Table 2: Final Demand and Number of Suppliers

Regions	Industries	Final Demand (Y)	No. of Suppliers	Supplier by Product
Oman	Chemical	14600	1	1
	Polymer	9500		1
	Metal	0		0
	Electricity	0		0
Kuwait	Chemical	0	2	0
	Polymer	8800		1
	Metal	13900		1
	Electricity	0		0
Qatar	Chemical	0	3	0
	Polymer	16000		1
	Metal	12000		2
	Electricity	0		0
UAE	Chemical	32000	6	3
	Polymer	0		0
	Metal	0		0
	Electricity	19000		1
Rest-of-the-World	Chemical	0	1	0
	Polymer	0		0
	Metal	16000		1
	Electricity	0		0