Hybrid welding processes have already been established for joining heavy plates. The presented approach of welding of thick metal sheets from one side combines a laser beam and two GMA welding torches in one setup. By using this hybrid process, it is possible to weld high material thicknesses, and manufacturing time can be significantly reduced in comparison to conventional multilayer arc welding processes. Additionally, new constructional opportunities can be used for reducing additive materials.

APPLICATIONS
Pipelines, wind energy towers, shipbuilding

TECHNOLOGIES
Laser GMA hybrid welding

MATERIALS
Pipeline steel

KEY FACTS
- One sided welding of thick metal sheets
- Significant reduction of manufacturing time in comparison to conventional multilayer arc welding processes
- Significant reduction of additive materials in comparison to conventional multilayer arc welding processes
- Minimization of the heat affected zone during hybrid welding processes

PARAMETERS
- Sheet thickness: 23.0 mm
- Welding speed: 1.5 m/min
- Laser beam power: 16.0 kW
- GMAW power: 2 * 11.0 kW

ACKNOWLEDGEMENTS
This work is part of the research project HYBRILAS, which is funded by the German Federal Ministry of Education and Research (BMBF), supported by the Association of German Engineers Technology Centre (VDITZ) within the research funding initiative Materials Processing with Brilliant Laser Beam Sources (MABRILAS).